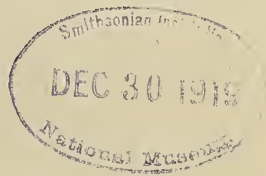


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ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

NEW SERIES. VOLUME V

1919

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#32
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NEW SERIES VOL. V

NO. 1

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN OF POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 1, 1919

The winter of 1918-19 was as exceptional in its mildness as the previous winter was exceptional in its severity. The thermometer only once registered zero at the Arboretum, and although little snow fell the ground was at no time frozen to any great depth. No injury has apparently been done by the winter to any plant in the Arboretum, but it is interesting to note that the leaves of the eastern American Yew (*Taxus canadensis*) growing in a position fully exposed to the sun are browner this spring than they were a year ago. The mild winter had, too, a curious effect on the winter flowering Witch Hazels. The American species (*Hamamelis vernalis*) flowered as usual at the end of December and in early January, but the Japanese and Chinese species did not open their flower buds until the end of February or a month or six weeks later than in previous years. The Chinese Witch Hazel (*H. mollis*) has not before been so covered with flowers; and as the plants grow larger the value of this beautiful shrub for the decoration of the winter garden is more clearly shown. The flowers of no other Witch Hazel are so large and beautiful, and the handsome leaves turn to brilliant shades of yellow and orange before falling in November. This plant is still rare in American gardens and probably is not to be found in American nurseries. Seeds have not yet been produced in the Arboretum, and it is only by grafting it on the American species that the Chinese plant can be now increased.

In spite of the mild weather in February and March vegetation in the Arboretum was not unusually advanced on the first of April. The Leatherwood (*Dirca palustris*) opened its flowers on the 6th of April,

or only a day earlier than last year, and other April flowering shrubs have blossomed at their normal time. On April 2nd the temperature fell to 23° Fahrenheit. This ruined the flowers of the north China Peach (*Prunus Davidiana*) which were just opening and those of the earliest of the Azaleas (*Rhododendron dahuricum*) whose rose-colored corollas were just emerging from the buds. On the nights of the 24th and the 25th the thermometer registered as low as 24°. This ruined the flowers of the early blooming Magnolias, but the flowers of the Forsythias, Cherries, Plums and Apricots show no signs of injury. Freezing weather in April is not unusual in New England and its effect on the flowers of different plants can well be studied by persons who have in mind the planting of spring gardens. The flowers of *Magnolia stellata*, *M. denudata* (better known as *M. conspicua*), *M. kobus* and its variety *borealis*, which open in April, are too often ruined by frost. To prevent this it is desirable to plant these trees and shrubs on the north side of other trees, and especially of evergreen trees, where the flowers may be expected to open seven or eight days later than on plants fully exposed to the sun. The hybrid Chinese Magnolias with pink or rose-colored flowers all bloom later than the white-flowered species and their flowers are rarely injured by cold although the unfolding petals of some of these hybrids were badly discolored by the cold of the past week. These hybrids therefore, although their flowers are less beautiful than those of the species, are better garden plants in this climate. The best known of these hybrids is called *M. Soulangeana*, of which there are several varieties differing in the greater or less amount of pink or rose color in the petals. The flowers of *Rhododendron dahuricum*, as has already been stated, were spoiled this spring but last year were uninjured. Its variety with persistent leaves (var. *sempervirens*) bloomed a few days later and escaped injury. A few days later the flowers of the north China and Korean *Rhododendron mucronulatum* opened, and although now beginning to fade were in good condition during fully two weeks. A more southern plant and therefore inclined to bloom later than *R. dahuricum*, it is a better garden plant in this climate and one of the handsomest mid-April flowering shrubs in the Arboretum. The Cornelian Cherry (*Cornus Mas*) is another plant for which the frosts of April have no terrors. The small, bright yellow flowers arranged in many-flowered clusters open late in March or in early April and remain in good condition for three or four weeks. There is no record here of their injury by frost. This is a shapely shrub or small tree of excellent habit; the leaves are bright green and the scarlet or rarely yellow fruit, which ripens late in summer, is cherry-like in appearance. The Cornelian Cherry is a native of eastern Europe and western Asia, and has been grown in Old World gardens for three centuries. There is no better early flowering shrub for our northern gardens in which, although it was brought to America certainly more than a hundred years ago, it is still too little seen.

Forsythias, after having lost a part of their flower-buds in three of the past five winters, are again covered with flowers which have not

been injured by the cold of the past week. The Arboretum collection contains specimens of all the species and varieties, and of many hybrids, and is interesting as indicating possibilities in plant breeding, when hybridizers enter a broader field than the one to which they have generally confined their efforts. The natural crossing of species of Forsythias has produced plants with handsomer flowers than those of their parents. This is true of some Lilacs and Crabapples, and of many Spiraeas, Deutzias and Rhododendrons, and it is not improbable that from the new material which has come into gardens in recent years handsomer garden shrubs and more valuable trees than those we now possess will reward the patient labors of the plant breeder. To the hybrid Forsythias the general name of *intermedia* has been given. The parentage of these plants is not perfectly clear, although one of their parents is certainly the Chinese *F. suspensa* var. *Fortunei*, the plant which is most often cultivated in American gardens. The handsomest of these hybrids and the handsomest Forsythia in the Arboretum collection, *F. intermedia spectabilis*, came here several years ago from a German nursery. The flowers of this form are bright yellow. Other handsome hybrids are var. *primulina*, with primrose-colored flowers, and var. *pallida*, with pale straw-colored flowers. The former appeared spontaneously in the Arboretum a few years ago. The flowerbuds of all Forsythias are often killed in severe winters, but those of these hybrids were for a long time believed to be hardier than those of the species, although in the winter of 1917-18 they suffered even more than those of their parents.

Prunus persicoides. This is a hybrid between the Peach and the Almond, which also produces handsomer flowers than its parents. The plants of this hybrid were in full bloom during the excessive cold of last week which did not injure them. The flowers are an inch and a half in diameter, with a bright red calyx, pale pink or nearly white petals blotched with deep rose at the base, and bright red filaments. This hybrid as a flowering plant is, perhaps, the handsomest of all the Peach-Apricot-Almond group. It originated in Europe more than a hundred years ago, but if it has never been common in American gardens it is no longer so; and it is doubtful if it is known to any American nurseryman.

The earliest Pear to flower, *Pyrus ussuriensis*, has been in bloom for more than a week and the flowers are untouched by frost. This is probably the largest of all Pear-trees as specimens occasionally occur in Korea sixty feet or more tall, with trunks 14 feet in circumference. The flowers are not as large as those of some of the other Chinese Pear-trees, and the fruit is small and of no value. This tree, however, is exciting much interest among American pomologists who believe they have found in it a blight resisting stock on which to graft garden pears.

The Cherries of Eastern Asia have never been more thickly covered with flowers than they have during the past week, and several of them are still worth a visit. The delicate petals of the flowers of these trees and shrubs seem able to bear without injury the coldest April weather Massachusetts has known for many years.

The earliest Cherry to bloom in the Arboretum this spring was *Prunus concinna*, a small tree discovered by Wilson on the mountains of central China. In the Arboretum it first flowered when less than three feet high; it is perfectly hardy, and although the flowers, which are white with a wine-colored calyx, are less beautiful than those of several other Asiatic Cherries it does not seem possible for any plant of its size to produce a more abundant crop. There has always been misunderstanding about this plant in gardens as it was distributed by a London firm of nurserymen as *Prunus subhirtella*.

Prunus tomentosa, a native of northern and western China begins to open its flowers only a day or two later than *P. concinna*. It is a shrub only five or six feet high, and when fully grown in abundant space for the spread of its branches often broader than tall. The flowers open from pink buds as the leaves begin to unfold, and the bright red stalks and calyx make a handsome contrast with the white petals which are often blotched toward the base with rose color. The small fruit ripens in June and is scarlet covered with short hairs, and is sweet and of good flavor. This shrub is attracting the attention of pomologists, living in the dry cold interior region of the continent where it is hardy and where it produces fruit of considerable comestible value. A form discovered in western China by Wilson (var. *endotricha*) is now established in the Arboretum where it blooms rather later than the northern plant. The fruit of this variety is destitute or nearly destitute of hairs.

Prunus incisa. This is another early flowering Cherry and a native of Japan where it is abundant on the eastern and southern slopes of Fuji-san and on the Hakkone Mountains. It is a large shrub or small tree with white or rarely pale rose-colored flowers which appear in drooping clusters before the deeply lobed leaves. The petals fall early, but the calyx, which gradually grows brighter in color, remains for some time on the young fruit and is showy. *P. incisa* is perfectly hardy in the Arboretum where it has now flowered for several seasons. For some reason this beautiful plant, however, is rare in American and European gardens.

Prunus triloba. Among the flowers of early spring few are more lovely than those of this little Almond from northern China which, in spite of the fact that it has flowered in the Arboretum every spring for thirty years, is still little known, although the form with double flowers (var. *plena*) is a common garden plant in this country and is often forced under glass for winter decoration. The single-flowered plant should be better known. It is a tall shrub with a rather irregular habit of growth. The flowers, which are pink, are produced in profusion.

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NEW SERIES VOL. V

NO. 2

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN OF POPULAR INFORMATION

JAMAICA PLAIN, MASS.

MAY 6, 1919

Japanese Cherry-trees. Of the numerous Asiatic Cherry-trees now established in the Arboretum the handsomest with single flowers are *Prunus serrulata* var. *sachalinensis*, the Sargent Cherry, *P. subhirtella*, and *P. yedoensis*. These three trees have flowered and produced their fruit for many years in the Arboretum, and have shown the ability to adapt themselves perfectly to the peculiar and difficult conditions of the New England climate. *P. serrulata* var. *sachalinensis* is the northern form of a Cherry-tree which occurs in three varieties in Japan, Korea, and central China. It was once an important tree in the forests of northern Japan and Saghalien but has now been largely cut for the wood which has been used for printing blocks. This Cherry was first raised here from seeds sown in 1890, and when in flower is the handsomest tree introduced by the Arboretum into western gardens. The delicate pink or rose-colored flowers are short-lived, but the handsome foliage which is distinctly tinged with red as the leaves unfold turns to brilliant shades of orange and red in the autumn. *Prunus serrulata* and its varieties have produced a number of forms with double flowers, and these are the hardiest and most valuable of the double-flowered Japanese Cherries which can be grown successfully in this climate. There are fourteen double-flowered named varieties of the Sargent Cherry in the Arboretum Collection, but only two or three of them are large enough to have flowered here. These double-flowered Cherries bloom two or three weeks later than the single-flowered trees, and from these may be expected some of the handsomest flowering trees which are hardy in the north. Although double-flowered Japanese Cherry-trees have been cultivated in the United States and Europe

for fully sixty years, they have never grown to a large size or given much satisfaction in western gardens. The trouble has been in the stock on which these double-flowered plants have been grafted. The proper stock for them is naturally the single-flowered species of which they are varieties, and if such stock is used there can be little doubt that larger and healthier trees will be secured than have been obtained when other species have been used as stock in Japanese and in American and European nurseries. It is fortunate that the plants of the Sargent Cherry produce every year good crops of seeds in the Arboretum; these seeds are carefully gathered and widely distributed so that there is reason to hope that in a few years this tree will adorn many American parks and gardens and supply stock on which the handsomest of the double-flowered Cherries can be successfully grafted.

Prunus subhirtella. This is the Spring Cherry of the Japanese, which one traveller has described as the most delightful and floriferous of all Japanese Cherries. It is a large shrub rather than a tree, and few plants can produce more flowers than the two large specimens in the Arboretum where they have been growing for twenty-five years. The flowers are drooping, pale pink becoming nearly white as they begin to fade. Those of no other single-flowered Cherry which has been grown in the Arboretum last so long in good condition. This Cherry is not known as a wild plant, but it is a good deal cultivated in the gardens of western Japan although rare in those of Tokyo. Unfortunately it does not reproduce itself from seed, for the seedlings are those of a tall slender tree common in the forests of central Japan to which the name of *Prunus subhirtella* var. *ascendens* has been given. This is still a rare tree in cultivation and its value in this climate is not yet established. A form of the variety *ascendens* of *Prunus subhirtella* has pendulous branches and is the well known Japanese Weeping Cherry-tree (var. *pendula*) now common in American gardens. *Prunus subhirtella* can be slowly propagated by soft wood cuttings, but the best way to increase it is by grafting or budding it on its own seedlings. Seeds are produced in quantity on the Arboretum plants and will be distributed to nurserymen anxious to obtain stock on which to work the true *P. subhirtella*. When the stocks are ready the Arboretum will supply a moderate number of grafts, and the nurseryman who will make it his business to produce a supply of this beautiful Cherry for American gardens will do a good thing for this country and incidentally for himself.

Prunus yedoensis. This is the Cherry-tree which has been planted in great numbers in the squares, parks and temple grounds of Tokyo. It is a fast-growing short-lived tree rarely fifty feet high, with a short trunk not more than a foot in diameter and wide-spreading or erect branches. The flowers are white and slightly fragrant, and are followed by abundant small black fruit. This Cherry reproduces itself from seed and there is therefore no reason why it should not be common in American gardens.

Amelanchiers. Shad Bushes, as Amelanchiers are often called because they are supposed to flower when shad begin to ascend the rivers from the sea, add much to the beauty in early May of the Arboretum where they have been planted in considerable numbers. Amelanchier is almost entirely confined to North America where many species are found from Saskatchewan to Louisiana and from the Atlantic to the Pacific, one extra American species occurring in central Europe and another in central China. All Amelanchiers produce abundant pure white flowers in short drooping racemes, and blue-black sweet and edible berry-like fruits. The American species vary from shrubs hardly more than a foot or two high up to trees exceptionally sixty or seventy feet tall. The first species to flower, *A. canadensis*, is the larger of the two tree species, and although it grows in western New York to a large size it is more common in the south where it is often the only species. The more common northern tree, *A. laevis*, is a native of the Arboretum and is readily distinguished in early spring by the purple color of its young leaves. *A. oblongifolia*, which is a large arborescent shrub, is also a native of the Arboretum. It is this species which is gray in early spring from the thick felt of pale hairs on the young leaves and flower-clusters, and which has been largely planted along the Arboretum drives and is in bloom this week. A large collection of the shrubby species, American and foreign, is in the border on the left-hand side of the Meadow Road and on some of these plants flowers will open until nearly the end of May. For the lovers of flowers the season of Shad Bushes is one of the interesting periods in the Arboretum.

Unfolding leaves. The leaves of many trees are highly colored when they first unfold and such trees, like many of the American Oaks, are as distinct and attractive in the spring as they are in their autumn colors. In Massachusetts Oak leaves are still closely infolded in their buds, but young leaves now give beauty and distinction to at least two Asiatic trees, *Cercidiphyllum japonicum* and *Acer griseum*. The former is an old inhabitant of the Arboretum, having been raised here first in 1878. It is the largest Japanese tree with deciduous leaves, growing from the ground with numerous great stems. The flowers and fruits are inconspicuous, but the pyramidal habit of the tree is handsome and interesting. It owes its name to the shape of the leaves which resemble those of the Redbud (*Cercis*); these as they unfold are of a delicate rose pink color, and although they turn clear bright yellow in the autumn it is during the last week of April and in the first days of May that the *Cercidiphyllum* is more beautiful than at any other season of the year. *Acer griseum* is a Chinese Box Elder or Negundo discovered by Wilson in central China, and just now very distinct in the red color of the young leaves. This Maple as it grows on the mountains of China is a tree sometimes seventy feet high, with a short trunk and a rather narrow head of ascending branches. Among Maples it is distinct in the beautiful lustrous bright reddish brown bark which separates freely in thin plates like that of some Birch-trees. This is the most distinct and the handsomest of the Maples introduced from China in recent years which have proved perfectly hardy in the Arboretum, but unfortunately it is still extremely rare in western gardens.

Prinsepia sinensis is again covered with clusters of bright yellow flowers which spring from the axils of the half-grown leaves. This *Prinsepia* is a tall broad shrub with long spreading and arching branches, and stems armed with many spines. It is perfectly hardy and the handsomest shrub Manchuria has contributed to western gardens. There are only two specimens in the Arboretum and these came here from Petrograd in 1903 and 1906, and it has been found difficult to propagate them by cuttings. Fortunately last year one of the plants produced for the first time a few seeds and these have germinated, so there is reason to hope if the Arboretum plants become more fruitful that this species will be a common ornament in northern gardens. It has much to recommend it as a hedge plant. The species from northern China, *P. uniflora*, is a spiny shrub with small white flowers, and although it has little beauty its value for forming impenetrable hedges may prove considerable.

Prunus dasycarpa, which is sometimes called the Black Apricot from the dark color of its slightly downy fruit, is the first of May one of the handsome flowering trees in the Arboretum. It grows here both as a great round-headed shrub with several stems or as a tree with a single trunk, and every year is completely covered with its flowers composed of pure white petals and a bright red calyx. This tree, although it has been known in European gardens for at least a century, is apparently extremely rare in the United States. Its origin is doubtful; it has been considered a native of Siberia, but it is now generally acknowledged that it is a hybrid between a Plum and an Apricot. Although this tree has been growing in the Arboretum for twenty years, there is no record that it has produced fruit here on more than two occasions.

Two Useful Shrubs. Two plants useful for covering the margins of drives and the borders of shrubberies, *Rhus canadensis* (*aromatica*) and the Yellow Root (*Xanthorrhiza apiifolia*) are covered with flowers. Those of the former are small, pale yellow, arranged in compact heads, and appear before or with the unfolding of the leaves composed of three leaflets; those of the Yellow Root are purple in long drooping, terminal racemes. The flowers of these two eastern American plants are attractive, but their great horticultural value is in their habit of growth. The height of the *Rhus* is from two to four feet, with spreading branches, the lowest flat on the ground, and with an irregular top. In the autumn the leaves turn bright scarlet. For road borders and to plant when it is desirable to make a connection between larger shrubs and the ground no other plant which has been tried here has proved so successful. The Yellow Root is a dwarf shrub which soon spreads over a wide border and forms with its erect stems and divided leaves an excellent ground cover. Unfortunately it has failed to grow well in those parts of the country where the soil is strongly impregnated with lime.

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NEW SERIES VOL. V

NO. 3

ARNOLD ARBORETUM

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BULLETIN

OF

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JAMAICA PLAIN, MASS.

MAY 10, 1919

New Chinese Cherry-trees. Among the numerous Cherries raised at the Arboretum from the seeds collected by Wilson in western China there are six which are good additions to the early spring flowering trees which can be successfully grown in this climate. The handsomest probably is *Prunus serrulata pubescens*. This tree is of the same species as the Sargent Cherry (*P. serrulata sachalinensis*), but is smaller, rarely growing in the forests which are its home to a greater height than fifty feet; the flowers open nearly a week later and are white faintly tinged with rose, and somewhat smaller. The leaves, too, are less deeply tinged with bronze color as they unfold. As it grows in the Arboretum the branches of this Cherry are ascending and slightly spreading, and form a narrow, open, graceful head. Plants raised from seeds which were gathered on the mountains of China only twelve years ago are seventeen or eighteen feet high, and have been covered this spring with flowers. This is the most widely distributed of these Cherries as it is spread over central and northern China to Korea and through Japan to Saghalien. *Prunus serrulata spontanea* differs from the last only in the absence of hairs on the young leaves and flower-clusters which are peculiar to that species, although the flowers, at least in some individuals, are slightly more tinged with rose, and the unfolding leaves are of a deeper color. This tree is almost as widely distributed as the last but does not range as far north in Japan. *Prunus canescens* is a smaller tree. Its greatest beauty, perhaps, is found in the bark of the trunk which is dark orange-brown, very lustrous, and separates freely into large persistent papery scales much curled on the margins. The flowers, which are small and purple-

rose color, cover the leafless branches from end to end and are more fragrant than those of any other Cherry in the collection. Another Cherry which should find a place in collections for the beauty of its dark lustrous birchlike bark is *Prunus serrula thibetica*, an inhabitant of the forests which cover the high mountains of the Chinese Thibetan border. It has a low, broad, round-topped head with a trunk unusually large for the height of the tree. This tree has not yet flowered in the Arboretum. *Prunus Dielsiana*, in habit and color of its bark, resembles the European *Prunus avium*, but the flowers are slightly larger and sometimes faintly tinged with pink. *Prunus pilosiuscula* is a tree of medium size and is chiefly valuable for the earliness of its flowers which open with those of *P. concinna* and *P. tomentosa*; they appear before the leaves and are pink, and solitary or in small two- or three-flowered short-stalked clusters.

New Chinese Pear-trees. Among the Pear-trees raised from seeds collected by Wilson in western China *Pyrus Calleryana* has created the most interest among American pomologists who now believe that they have in it a stock on which to graft the garden Pears more resistant to blight than any that has yet been tried; and the seeds now produced in large quantities by the trees in the Arboretum are sought by the Department of Agriculture of the United States and by nursery-men who are anxious to provide the country with a possible remedy for the disease which has destroyed many American Pear-orchards. The new Chinese Pears have grown even more rapidly than the Chinese Cherries, and among them are beautiful clean-stemmed specimens from seventeen to twenty feet high, only twelve years old from the seed, and now giving every promise of reaching the height of fifty feet which these trees often attain on their native mountain sides. *P. Calleryana* is a shapely pyramidal tree more compact in habit than the other Chinese species. The flowers are smaller, and the globose brown fruit is hardly more than a third of an inch in diameter. To students of cultivated fruits *Pyrus serotina*, another of Wilson's introductions, is of particular interest, for this tree of the mountain forests of western China is now believed to be the origin of the brown or yellowish, round, hard and gritty Sand Pears which in many varieties the Japanese have cultivated from time immemorial and which must have been introduced into Japan probably by the way of Korea. In the early days of western intercourse with Japan many varieties of the Sand Pear were brought to the United States and Europe, but except for the beauty of their flowers and fruits they have proved to be of little value, for the fruit is so hard and so full of grit that it is not even worth cooking. It was probably forms of the Sand Pear crossed with one of the cultivated garden Pears which produced the Leconte and Keiffer Pears from which much was at one time expected in this country, especially in the southern states, but which have proved so susceptible to blight that the cultivation of these trees has been now largely abandoned. The flowers of *Pyrus serotina* are larger than those of *P. Calleryana*, but there is little beauty in their small brown fruit; and the habit of the tree with its long spreading branches forming an

open irregular head is not particularly attractive. Of better habit is *Pyrus serrulata*, a fast-growing tree with large flowers which have been only sparingly produced in the Arboretum. The Chinese form of *Pyrus pashia* raised from Wilson's seeds is also established in the Arboretum where it is now flowering. The Himalayan form of this tree was first sent to Europe in 1825, but has not been tried in the Arboretum where it would probably not be hardy. In addition to the four Pear-trees from western China there are five other Chinese species established here, *P. ussuriensis*, the wild Pear-tree of Korea and Manchuria, and extending into northern China and into Japan; *P. Bretschneideri*, a northern tree with juicy yellow fruit of good flavor; *P. ovoidea*, another northern species with yellow fruit tapering from a broad base to a narrow apex, and *P. betulaefolia* and *P. phaeocarpa*, species with small brown fruit, that of the latter globose on some individuals and pyriform on others. Taken as a whole the Chinese Pear-trees make one of the interesting groups in the Arboretum, and as early spring flowering trees they take rank with the Crabapples, although the open flowers, which are often tinged with pink while in the bud, are white and so lack the variety of colors which add so much beauty to the flower-buds and flowers of the Asiatic Crabapples.

Two Korean Azaleas. Two of its most beautiful plants have come to the Arboretum from Korea, *Rhododendron* (*Azalea*) *Schlippenbachii* and *R. (Azalea) poukhanense*. The former is a shrub which on the wind-swept, grass-covered cliffs of the Korean coast rises only a few inches above the surface of the ground, but in the forests of the north is a shrub twelve or fifteen feet high with a tall, stout stem. The leaves of this Azalea are clustered at the ends of the branches, and are broadest at the apex; they are larger than those of most Azaleas, becoming sometimes three inches long and an inch or an inch and a half wide. The flowers, which appear before the leaves, are in clusters, pale pink with dark spots at the base of the upper three lobes of the corolla, and three inches in diameter. There can be little doubt of the hardiness of this Azalea, for in northern Korea it grows to its largest size where the thermometer falls to 30° below zero Fahrenheit and a freezing temperature is not uncommon in August. In the Arboretum the flower-buds were not injured by the cold winter of 1917-18 on plants growing in an exposed position. Although known to Russian botanists as long ago as 1870 this plant does not appear to have attracted the attention of western gardeners until 1892 when the late J. H. Veitch found a plant growing in a nursery in Tokyo and sent it to England. In the edition of the Catalogue of the Yokohama Nursery Company, of 1901, *Azalea Schlippenbachii* appeared, and at about this time it was imported by Mr. Thomas E. Proctor and planted in his garden in Topsfield, Massachusetts, where the plants are still growing. These are the oldest and largest in the United States, for the Arboretum plants were raised here from seeds brought home by Mr. J. G. Jack from Korea. *R. Schlippenbachii*, although it has remained exceedingly rare in western gardens, will probably be much better known in a few years, for in the autumn of 1917 Mr. Wilson sent from Korea a large

quantity of the seeds to the Arboretum. These were distributed among the best gardeners in the United States and in Europe, and as several thousand seedlings have been raised in the Arboretum nurseries, there seems now to be no reason why this beautiful plant should not become one of the chief beauties of spring gardens in regions too cold for the successful cultivation of any other Azalea with such large and beautiful flowers. The other Korean Azalea now in flower, *R. poukhanense*, is a smaller plant, rarely growing more than three feet high on the Pine-covered mountain slopes of the central part of the peninsula. It was first raised at the Arboretum from seeds also brought home by Mr. Jack, and its beautiful rose-lilac, fragrant flowers have been freely produced here now every spring for several years. As it grows in the Arboretum this Azalea is a low, broad, round-topped shrub with its lower branches close to the ground. Roots are produced by such branches and would, if cut off and planted, probably soon produce flowering plants. *Rhododendron poukhanense*, although practically unknown as a garden plant beyond the limits of the Arboretum, deserves a place in all New England collections. These two Azaleas are now in bloom on Azalea Path where *R. (Azalea) Kaempferi* will soon be covered with its red or salmon-colored flowers, and *R. (Azalea) rhombicum* has been in bloom during the past week. This is a hardy Japanese species with rose-purple flowers which are beautiful on plants so placed that the color of the flowers does not conflict with that of other Azaleas.

Early flowering Viburnums. Two Viburnums have been flowering for several days, one from northeastern North America and the other from the sea cliffs of southern Korea. The American species, *Viburnum alnifolium*, the Hobble Bush or Moosewood of cold wet northern woods, is one of the species with wide flat clusters of small flowers surrounded by a ring of showy white sterile flowers; the fruit is red when fully grown but finally becomes black, and the large leaves turn deep wine color in the autumn. The Korean species, *Viburnum Carlesii*, is fast becoming a popular plant in American gardens. The chief value of this shrub is in the white extremely fragrant flowers which are produced in compact clusters and open from rose-pink buds. The buds do not all open at the same time and the mixture of pink buds with open flowers adds greatly to the interest and beauty of this shrub.

The Asiatic Crabapples are beginning to bloom and *Malus baccata* var. *mandshurica*, *M. micromalus* and *M. Halliana* have been in flower for several days. The large white flowers of the first of these trees are more fragrant than those of any other Asiatic Crabapple in the collection which now contains all the species and many varieties and hybrids.

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ARNOLD ARBORETUM

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JAMAICA PLAIN, MASS.

MAY 16, 1919

Asiatic Crabapples. The flowering of these trees makes one of the principal spectacular displays of the year in the Arboretum; and of these displays only that made by the Lilacs attracts a larger number of visitors. Most of the plants will be in flower when this Bulletin reaches its Boston readers who can see these trees and shrubs on the left-hand side of the Forest Hills Road entering by the Forest Hills gate, and in a larger and more complete collection at the eastern base of Peter's Hill. Among these Crabapples are a number of small trees which should find a place in every northern garden for few trees which are hardy in New England are more beautiful when covered in May with their white, pink or rose-colored flowers, or in autumn when the branches are loaded with their brilliant red, scarlet or yellow fruits.

Malus baccata mandshurica is the earliest of these Crabapples to open its flower-buds in the Arboretum. A native of Manchuria, Korea and northern Japan, it is the eastern form of the better known *Malus baccata*, the Siberian Crabapple, which reached Europe more than a century ago and for a long time was one of only two Asiatic Crabapples known in western gardens. The Manchurian form as it grows in the Arboretum is a tree twelve or fifteen feet tall and broad; the flowers, which are produced in profusion, are pure white, rather more than an inch across, and more fragrant than those of any other Asiatic Crabapple. The fruit is round, yellow or red, and not larger than a large pea. A form of this tree (var. *Jackii*) brought from Korea by Mr. Jack in 1905 is distinguished by its large, dark scarlet fruit. The Manchurian Crabapple, which is still rare in this country, for the fragrance of the flowers alone should find a place in all collections.

Malus cerasifera. This is another of the early flowering Crabapples and is believed to be a hybrid between *M. baccata* and *M. prunifolia*. Planted in good soil and allowed sufficient room for development it will grow into a large shapely tree with a broad, round-topped, irregular head of spreading often drooping branches. The flowers are fragrant and larger than those of the other Asiatic Crabapples, with pure white or occasionally greenish petals; and the fruit, which varies in size on different plants, is globose and dull red.

Malus micromalus, which is also an early flowering plant, is one of the least known of the Crabapples. It was first sent to Europe from Japan by Von Siebold in 1856 under the name of "Kaido," a name which in Japan belongs to *Malus Halliana*. In Japan this tree is rare and known only in gardens, and by Japanese botanists is believed to have been introduced into their country from China and to be a hybrid possibly of *M. baccata* with *M. spectabilis*. The habit of this plant is more pyramidal than that of other Crabapples and this habit makes the plants conspicuous in the collection. The largest plants are covered this year with their small, pale pink, delicate flowers which will be followed by light yellow fruit, often rose color on one cheek. A plant of *Malus micromalus* first came to the Arboretum from the Paris Museum in 1888 and the plants now growing here are descendants of that plant. It is still one of the rarest of the Asiatic Crabapples in western gardens.

Malus Halliana, with its form *Parkmanii* which has double flowers, is perhaps the most distinct of all Crabapples in the color of its rose-red flowers. It is a shapely small tree, with erect and spreading stems forming a narrow vase-like head, and dark green leaves. The globose reddish fruit is not larger than a small pea. The Parkman Crab was among the first Japanese trees to reach this country direct, having been sent by Dr. George R. Hall in 1862 to Boston where it was first planted in Mr. Francis Parkman's garden on the shores of Jamaica Pond. This Crabapple is a favorite in Japanese gardens where it is known as "Kaido," but has not been found in a wild state. Whatever its origin the Parkman Crab is one of the most distinct and beautiful of the small trees which flower here during the early days of May.

Malus theifera from central and western China is closely related to Hall's Crab. It is one of Wilson's introductions through seeds sent to Veitch in 1900 and in 1907 to the Arboretum where it is now twelve feet high. It has upright, spreading, rather zigzag branches which are densely studded with short spurs which bear numerous clusters of flowers rose-red in the bud, becoming pale and almost white when fully expanded. In central China the peasants collect the leaves and from them prepare the palatable beverage which they call red tea. From this the specific name is derived.

Malus floribunda, by many persons considered the most beautiful of Crabapples, was introduced into Holland by Von Siebold in 1853 from Nagasaki, Japan. The place where it grows wild still remains unknown, although probably it is one of the high mountains of Kyushu. Japanese botanists and nurserymen confuse it with the Parkman Crab, and

Wilson has not seen it in Japanese gardens. It is a broad, round-topped, treelike shrub sometimes twenty-five feet tall with stout branches and slender arching and pendent branchlets. The clustered flowers are white when fully expanded, rose-red in the bud, and as they open in succession the two colors make a beautiful contrast. The fruit is about the size of a pea, yellowish or yellowish brown; from some plants it falls in the early autumn, on others it remains on the branches during the winter or until devoured by birds who are particularly fond of it. Several plants with persistent fruit are growing close to the Administration Building in the Arboretum, and during the winter are filled with numerous species of birds, including pheasants who are fond of these Crabapples. A hybrid between *M. floribunda* and perhaps *M. cerasifera* appeared in the Arboretum among a lot of seedlings of *M. floribunda* in 1883 and has been named *M. Arnoldiana*. It has the habit and abundant flowers of *M. floribunda*, but the flowers and fruit are nearly twice as large. It is a handsomer plant than *M. floribunda* and one of the most beautiful of the Crabapples in the Arboretum.

Malus Sieboldii is another of the species introduced from the gardens of Japan into Europe by Von Siebold in 1853. It is a low, dense shrub of spreading habit with the leaves on vigorous branchlets three-lobed, small flowers white tinged with rose in color, and small yellow fruits. A good specimen may be seen on the left hand side of the Forest Hills Road. Von Siebold's Crab is really a dwarf form of a species common on the Korean Island of Quelpaert, and on the mountains of central Japan and Hokkaido, to which the name var. *arborescens* has been given. This is a tree often thirty feet or more tall, with ascending, wide-spreading branches, twiggy branchlets and minute fruit yellow on some and red on other individuals. Although the flowers are small, they are produced in immense quantities, and this species has the advantage of flowering later than the other Asiatic Crabapples. Another variety of Von Siebold's Crab (var. *calocarpa*), raised in the Arboretum from seed sent in 1890 from the Nikko mountains of Japan by Dr. W. Sturgis Bigelow of Boston, has bright red fruits each half an inch in diameter. When in fruit this is the handsomest of the Japanese Crabapples.

Malus Sargentii from salt marshes in the neighborhood of Muroran in northern Japan, where it was discovered by Professor Sargent in 1892, has qualities which give it a field of usefulness peculiarly its own. This species is a dwarf with rigid and spreading branches, the lower branches flat on the ground; it is well suited for covering slopes and banks. The flowers are in umbel-like clusters, saucer-shaped, round and of the purest white, and are followed by masses of wine-colored fruit which is covered by a slight bloom and unless eaten by birds remains on the plants well into the spring.

Malus spectabilis, cultivated by the Chinese from time immemorial and introduced from Canton in 1780, was the first of the Asiatic Crabapples cultivated in Europe. Like several other species it is not yet known in a wild state but is probably of hybrid origin. It is a tree

from twenty-five to thirty feet high, with a wide vase-shaped crown made of numerous spreading and ascending branches and short branchlets. The flowers are pale pink, more or less semidouble and very fragrant; and the fruits are pale yellow, nearly globose, and about three-quarters of an inch in diameter.

Malus Scheideckeri is supposed to be a hybrid between *M. spectabilis* and some unknown species, possibly *M. micromalus*. It is a small pyramidal tree with small flowers produced in great abundance, and is well worth a place in every collection of these trees.

Malus prunifolia var. *rinki*, the Apple cultivated in Japan for its fruit before the advent of foreigners and of Chinese origin, has been mentioned in former Bulletins, notably that of May 15, 1916. The wild type of this apple was discovered by Wilson in central China in 1907. From seeds sent to the Arboretum plants were raised and one of them is now blooming for the first time; it is on Bussey Hill, in the collection of Chinese Apples, Pears and Cherries. This is now a small tree about ten feet high, with flowers like those of the common Apple and fully an inch and a half across. The fruit of *rinki* is longer than broad, yellow with a reddish cheek or entirely red, and the persistent calyx is raised, and not depressed as in the common Apple. This is the wild parent of the race of Apples long cultivated in the Orient, and since it fruits freely in the hot moist valleys of central China equally as well as in the cold regions of northern Korea it may prove of value to pomologists in breeding new races of Apples.

Space does not permit even a brief mention of all the species and hybrids of all the Asiatic Crabapples in the Arboretum collection. Among them, however, are trees suitable for the avenue, park or garden, shrubs for lawn borders and the slopes of banks, all absolutely hardy in the coldest parts of New England, and all to be depended upon to produce in spring blossoms in profusion. The plants grow quickly in good soil, love to have the breezes blow freely through their branches, and many of them begin to flower and produce fruit when only a few years old. In collections like that of the Arboretum they hybridize freely, and the species can only be propagated by grafting or budding.

Asiatic Quinces. In the Shrub Collection many varieties of these plants are growing and are now in full bloom. The flowers vary from white, flesh, pink and salmon to scarlet and fiery crimson, and no group of plants has more vivid blossoms. The numerous forms are derived from the Chinese *Chaenomeles lagenaria* (better known perhaps as *Pyrus japonica*), and the true Japanese *C. japonica* (*C. Maulei*) and have been cultivated for many centuries in the gardens of China and Japan.

The earliest of the Lilacs to bloom, the Chinese *Syringa affinis* and *S. oblata*, are in flower and the collection will probably be at its best about May 24th. The red-flowered Japanese Azalea (*Rhododendron Kaempferi*) is just opening its flowers on Azalea Path, and Fothergillas, many Spiraeas, Pearl Bushes, many Honeysuckles, Barberries and other interesting plants will be in bloom when this Bulletin reaches its Boston readers.

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NEW SERIES VOL. V

NO. 5

ARNOLD ARBORETUM

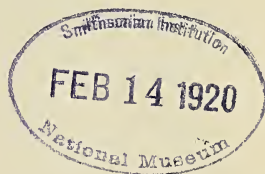
HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION



JAMAICA PLAIN, MASS.

MAY 23, 1919

Lilacs. Many additions to the Lilacs which can be cultivated in our gardens have been made during the last fifty years, and there are now in the Arboretum collection some twenty-three species, several hybrids, and one hundred and sixty or seventy forms of the common garden Lilac (*Syringa vulgaris*). Lilacs to most people mean tall bushes with lilac-colored or with white fragrant flowers, the forms of *Syringa vulgaris* found in all old gardens and known in the eastern states at least since the middle of the 18th century, the plants loved by Washington and planted by him in his garden at Mt. Vernon. A good example of these old-fashioned Lilacs can be seen in the Arboretum on the east slope of Bussey Hill just below the overlook. These Lilacs were planted at least a hundred years ago by Benjamin Bussey on each side of one of his garden walks which they have now obliterated. These old Lilac bushes bloom every year and their flowers, although small, are more fragrant than those of many of the modern varieties. Although the common Lilac reached England from Constantinople as early as 1593 it is only in comparatively recent years that horticulturists have seriously undertaken the task of improving the flowers by selecting and propagating the most distinct seedling forms and by crossing these among themselves. The largest number of these improved forms of the common Lilac have been made by the French nurseryman Lemoine of Nancy; many of the good varieties were raised in Germany and in recent years Mr. John Dunbar of Rochester, New York, has raised a few seedling Lilacs which seem destined to find a permanent place in gardens. Only a few hybrids between species of

Lilacs have yet been raised, but the crossing of some of the new Chinese species might well produce forms unlike any of the Lilacs now in cultivation. At present only four hybrid races of Lilacs are in cultivation. The first of these appeared about 1810 in the Botanic Garden at Rouen in France, and originated probably by a natural cross between the common and the Persian Lilac (*S. persica*). Through some unfortunate confusion of names the plant is called *Syringa chinensis*; a much better name for it is *S. rothomagensis* which it is often called. This is a vigorous shrub often fifteen feet tall and broad, with narrow leaves and great clusters of small red flowers so heavy that the slender branches droop under their weight. Where plenty of room can be given it this is one of the best of all Lilacs. There is a form with pale flesh-colored, nearly white flowers which is not as handsome as the red-flowered form, and there are other varieties which differ in the slightly darker color of the flowers. The next hybrid Lilac to appear, *Syringa hyacinthiflora*, is the result of crossing *S. vulgaris* with *S. oblata*, a large round-topped shrub from northern China with broad, thick, lustrous leaves and small clusters of large, exceedingly fragrant, lilac-purple flowers. This hybrid has the habit and the foliage of *S. oblata* and small, semidouble, violet, fragrant flowers in small clusters. It blooms earlier than any of the forms of *S. vulgaris*, but has little to recommend it as a garden plant. The general name of *Syringa Henryi* has been given to a group of hybrids between the Hungarian *S. Josikaea* and the Chinese *S. villosa*, raised several years ago at the Museum in Paris. These plants, like both of their parents, bloom after the flowers of *S. vulgaris* have faded; they have the dark blue-violet flowers of the Hungarian plant and the large leaves of *S. villosa*. The handsomest of this breed is called Lutèce and is a valuable addition to the late-flowering Lilacs. The latest of the hybrid Lilacs was raised by Lemoine by crossing *S. vulgaris* with the variety of the Chinese *S. affinis* with fragrant violet-colored flowers (var. *Giraldii*). The plants of this hybrid grow rapidly and have the tall loose habit of the Chinese plant; like it, too, they bloom early and their flowers are fragrant. Forms of this hybrid appeared in Lemoine's recent catalogue under the names of Berryer, Claude Bernard, Lamartine, Mirabeau, Pascale and Vauban. These have only recently been added to the Arboretum collection and it is too soon to speak of their value here as garden plants. Among the Chinese species which have been introduced in the last forty years those which will certainly retain a permanent place in gardens are *S. pubescens*, *S. villosa*, *S. Sueginzovii*, *S. tomentella*, *S. Julianae* and *S. Komarowii*. By crossing the seedling varieties of *S. vulgaris* the blooming period of the Lilac has been extended, the size of the flowers and of the flower-clusters has been increased. many forms with double flowers have been raised; and new colors ranging from pale pink to dark red and to blue have been produced. As with Roses, some of the new forms have lost much of the fragrance of the flowers which is one of the great qualities of the old-fashioned garden Lilacs.

Chinese Cotoneasters. Many of these plants are now in flower in the Shrub Collection and among the Chinese plants on Bussey Hill. There

are twenty-four species and varieties of these plants established in the Arboretum, raised from seeds collected by Wilson in central and western China, and taken as a whole this is the group of shrubs introduced by the Arboretum from China which promises to be of the greatest value for the decoration of New England gardens. For garden purposes they can be arranged according to their habit of growth, the color of their flowers and the color of their fruit as follows:

1. Prostrate shrubs with wide-spreading branches, small red flowers and fruits, and small thick dark green leaves persistent in this climate until the beginning of winter, *C. adpressa*, *C. apiculata*, *C. horizontalis* and its varieties *perpusilla* and *Wilsonii*; of these varieties *perpusilla* is much dwarfer than the common form of *C. horizontalis*, and *Wilsonii* is taller than the others.

2. Large shrubs with white flowers and red fruits, *C. hupehensis*, *C. multiflora calocarpa*, *C. racemiflora* and *C. racemiflora soongorica*. In this group are perhaps the handsomest of these plants. *C. hupehensis* is a tall, broad, fast-growing plant with dark green leaves, larger flowers than those of the other species, and large, scarlet fruits. The flowers are in compact clusters which entirely cover the branches, but the fruit has been only sparingly produced in the Arboretum. The other plants in this group have blue-green leaves and gracefully arching stems. The flowers are rather smaller than those of *C. hupehensis* but the conspicuous fruit, although rather duller in color than the fruit of that species, covers the branches for many weeks in the early autumn. Judged by its gracefully arching branches, its abundant flowers and the size, color, and quality of its fruit, *C. racemiflora soongorica* is the handsomest of the Chinese Cotoneasters which can be grown in this climate and one of the handsomest shrubs of recent introduction.

3. Shrubs with red flowers and fruits, *C. divaricata*, *C. bullata* var. *macrophylla*, and *C. bullata*, var. *floribunda*, *C. Dielsiana*, *C. Dielsiana* var. *elegans*, *C. Zabellii*, *C. Zabellii*, var. *miniata*, *C. Franchetii*, *C. obscura*. In this group *C. divaricata* and *C. Dielsiana* and its variety are perhaps the most desirable garden plants. They have wide-spreading, slightly drooping branches, small, dark-green lustrous leaves, and small rather inconspicuous flowers and fruit. *C. Franchetii* appears less hardy in the Arboretum than the others.

4. Shrubs with red flowers and black fruit, *C. nitens*, *C. acutifolia*, *C. acutifolia* var. *villosula*, *C. ambigua*, *C. foveolata* and *C. moupinensis*. Of this group *C. nitens*, although the flowers and fruit are small, is perhaps the most attractive, for none of the Chinese Cotoneasters have more gracefully spreading branches and more lustrous leaves; and it may well be placed among the four or five of the handsomest of all the deciduous leaved species of Cotoneaster which can be grown in this climate. *C. moupinensis* and *C. foveolata* are the tallest of the Chinese Cotoneasters, with much larger leaves than the others, the former becoming almost treelike in habit. They are coarse and not very attractive shrubs, but the brilliancy of the autumn color of the leaves of *C. foveolata* entitles it to a place in the collection. The Chinese Cotoneasters produce great quantities of seeds in the Arbore-

tum, and during the last two or three years these have been distributed among American nurserymen. They are easily raised and grow rapidly, so that there seems a chance that these beautiful plants will soon be seen in many American gardens.

Azaleas. This is a good year for most of the Azaleas. The earliest of them, *Rhododendron dahuricum* and *R. mucronulatum* (all Azaleas are now called Rhododendrons), were full of flower-buds, although those of the former were killed by a late frost. The red-flowered Japanese *R. Kaempferi* has never before been so splendid, and *R. Vaseyi*, the earliest of the American species to bloom, is as usual covered with its clear pink or rarely white flowers, and these in a few days will be followed by the rose-pink flowers of *R. canescens* and *R. nudiflorum*; and for nearly two months more Azalea flowers will add beauty and interest to the Arboretum.

Lonicera syringantha. Attention is called to the plant of this Chinese Honeysuckle in the collection of Chinese Shrubs on Bussey Hill, which is now covered with its small violet colored and violet scented flowers which have not before been produced in such profusion. The arching stems, small leaves and fragrant flowers make this one of the most charming plants blooming this spring in the Arboretum. Many other Honeysuckles are flowering now in the Shrub Collection, and on the right-hand side of the Bussey Hill Road. Here is a good opportunity to see how Bush Honeysuckles of the Tartarian type and its hybrids can develop into great shapely bushes when they are allowed sufficient space in which to grow.

The earliest Rose to flower in the Arboretum this year is *R. Ecae*, a native of Afghanistan and Turkestan; it has erect stems, leaves with small, very lustrous leaflets, and pale yellow flowers not more than an inch in diameter. The first flowers of *R. Hugonis*, *R. omeiensis* and *R. cinnamomea* are also opening. *R. Hugonis* has not before in the Arboretum been so full of flower-buds, and next week to any one interested in Roses will well repay a visit.

Viburnums of the week are the English Traveller's Tree, *Viburnum lantana*, and the American Black Haw, *V. prunifolium*. The former is a tall, broad bush, with wide gray-green leaves and large convex clusters of white flowers which are followed by handsome and abundant lustrous fruits, bright red when fully grown, and then gradually turning black. This is one of the European shrubs which grows as well here as in its native country. Fortunately it can now be found in American nurseries. The Black Haw is an arborescent shrub or a tree occasionally thirty feet high with a round-topped head of spreading branches; the narrow pointed leaves are lustrous and in the autumn turn deep rich wine color; the flowers are white, in rather smaller clusters than those of the other American tree Viburnums, and the large fruit in drooping clusters is dark blue or nearly black and covered with a glaucous bloom. This is a good plant for wood-margins and the borders of roads.

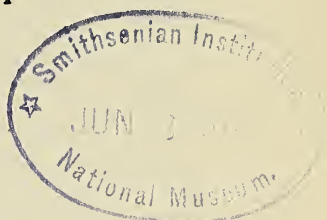
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NEW SERIES VOL. V

NO. 6

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

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Horsechestnuts and Buckeyes. Horsechestnut as generally applied is the name of the Old World species of *Aesculus*, and Buckeye is commonly used for the American species of this genus. The Old World species which are found in southeastern Europe, on the Himalayas, in central and northern China and in Japan have white flowers often marked or tinged with yellow, but the flowers of the American species are yellow, red, scarlet, red and yellow, and white. The European species, however, are best distinguished from those of the New World by the resinous exudations which thickly cover their winter buds and are not found on those of the American species with the exception of the one which grows in California (*A. californica*). The original Horsechestnut, *Aesculus Hippocastanum*, long cultivated in western Europe but only in recent years known to be a native of the mountains of Greece, is the handsomest of the whole genus and one of the most splendid trees in the world. It was brought to America at least one hundred and fifty years ago, and there are noble specimens in many of the seaboard cities and towns of the eastern states. The Himalayan Horsechestnut and the species of central China are not hardy here; it has not yet been possible to establish the north China Horsechestnut in the Arboretum, but the Japanese species (*A. turbinata*) is hardy and grows fairly well here, although it is less satisfactory in cultivation and a less beautiful tree than the Grecian Horsechestnut. The earliest of these trees to flower here are the Ohio Buckeye and its varieties. They are small trees with small yellow or yellow-green flowers, and fruit covered like that of the Old World Horsechestnuts with prickles. These trees have no great value as ornamental trees, but are inter-

esting in having furnished from their fruit one of the great states of the union with its popular name. A related species, *A. arguta*, has not before bloomed so well in the Arboretum. It is a small yellow-flowered shrub, with leaves composed usually of nine narrow long-pointed leaflets, which has been found only in west central Oklahoma and in a few places in northern and central Texas. The yellow-flowered Appalachian species, *A. octandra*, the largest of the Buckeyes, blooms a little later, but a shrubby species from central Georgia (*A. georgiana*) is just now covered with its short compact clusters of large yellow and red flowers. Of recent discovery and introduction this Buckeye has proved a first-rate garden plant in this climate. *Aesculus Pavia*, the best known, in books at least, of the red-flowered southern Buckeyes, is in bloom this year for the first time in the Arboretum. An even more beautiful plant, the red-flowered variety of *A. discolor* (var. *mollis*) will be covered in a few days with its scarlet flowers. Generally distributed from the coast of North Carolina to southern Arkansas and western Texas, and when in flower one of the most brilliant plants of the south, it is a matter of congratulation that it can be grown successfully in Massachusetts. Many of the handsomest of the Horsechestnut-trees are natural hybrids. The first of these appeared in France more than a century ago and is evidently a cross of two American species, *A. octandra* and *A. Pavia*. There are many forms of this hybrid to which the general name *A. versicolor* has been given. The flowers are red and yellow in various degrees and some of these forms can be placed among the most beautiful of the Buckeyes. The next hybrid appeared many years ago in a nursery at Ghent in Belgium, evidently a cross between the common Horsechestnut and the American red-flowered *A. Pavia*. This is the common red-flowered Horsechestnut of gardens the name of which is *A. carnea*. The flowers vary from flesh color to the deep red of those of the tree known as *A. Briotii*. Trees of this and other varieties of the red-flowered Horsechestnut are now in bloom in the Horsechestnut Group on the right-hand side of the Meadow Road. A single tree of an interesting hybrid Buckeye, *A. Bushii*, was found a few years ago in the woods near Fulton on the Red River in Arkansas, evidently produced by the crossing of a form of *A. glabra* with the red-flowered *A. discolor* var. *mollis*. The original tree has disappeared but this hybrid is fortunately preserved in a tree growing on Peter's Hill in the Arboretum where it has flowered regularly for several years. This perhaps is the rarest tree in the Arboretum.

American Magnolias. Several of these trees are in bloom in the group on the right-hand side of the Jamaica Plain Gate. Unlike most of the Asiatic species the American Magnolias flower after the appearance of the leaves; they are hardy and handsome trees. A hundred and fifty years ago letters of English plant lovers written to their American correspondents contained many appeals for Magnolia plants and seeds, and in the early years of the nineteenth century these trees were to be found in the principal collections of plants in the middle states. To the present generation they are almost unknown, and it is only in a few American nurseries that an occasional plant of one or two of the species can be found. There are six of these Magnolias, but one of them, *M. pyramidata*, grows only in the extreme southeastern corner of Alabama and adjacent Florida, and would not

be hardy here. Of the other species, the so-called Mountain Magnolia, *M. Fraseri*, is the first to open its flowers in the Arboretum. It is a small tree rarely more than forty feet high, with an open head of long branches, leaves often a foot in length and deeply divided at the base, and creamy white, sweet-scented flowers eight or ten inches in diameter and very conspicuous as they stand well above the crowded leaves at the ends of the branches. This Magnolia is a native of the southern Appalachian Mountain region and, although it has not been found growing north of southeastern Virginia, is perfectly hardy in eastern Massachusetts. The next to flower is *M. cordata* which for several days has been covered with its cup-shaped, bright canary yellow flowers unlike in color those of any other Magnolia. There is an interesting story connected with this tree. It was discovered toward the end of the eighteenth century by the French botanist and traveller Michaux on one of his journeys from Charleston, South Carolina, up the valley of the Savannah River to the high Carolina Mountains. By Michaux it was introduced into French gardens where it flourished. For more than a century every attempt to rediscover this tree failed, and it is only within the last five or six years that it was found by the Berckmans Brothers growing in the woods not many miles distant from Augusta, Georgia, where plants only a few feet high flower profusely. Grafts from Michaux's trees, however, preserved this tree in cultivation, and the plants in the Arboretum were raised from grafts taken from old trees in the Harvard Botanic Garden for which they were imported from Europe probably when the Garden was laid out, that is, more than a century ago or not long after Michaux had discovered and introduced this tree. The flowers of *M. cordata* will be followed in succession by those of *M. acuminata*, the Cucumber Tree, *M. tripetala*, the Umbrella Tree, *M. glauca* and *M. macrophylla*. As they flower attention will be called to some of these trees in later issues of these Bulletins.

Diervilla florida venusta. Attention has been called before to the beauty of this Korean shrub. It is the first of the Diervillas to flower and for more than a week it has been covered with its large rose-pink flowers which open when the leaves are not more than half grown. It is a vigorous, perfectly hardy plant, and none of the hybrid Diervillas to which so much attention has been paid by European gardeners compare in beauty with this wild plant which is one of the commonest shrubs of central and northern Korea. The flora of Korea is not rich in trees and shrubs as compared with those of western China and Japan and not many endemic Korean plants have been established in western gardens. It is interesting, therefore, to find that five of the hardiest and most beautiful shrubs introduced in recent years into gardens are from Korea. They are *Viburnum Carlesii*, *Diervilla florida venusta*, *Rhododendron Schlippenbachii*, *R. poukhanense* and *Rosa Jackii*. Korea has given us, too, a Fir in *Abies holophylla* which, although the seeds were first planted at the Arboretum in 1904, has grown so rapidly here and has proved so hardy that it promises to rival as an ornamental tree the Japanese *Abies homolepis (brachyphylla)*. In Korea *A. holophylla* grows to a height of one hundred feet, and in the northern part of the peninsula forms pure forests often of considerable extent. In a few years it will be possible to obtain at the Arboretum a better idea than we have now of the value of the plants of Korea in this

climate, for there are growing here now seedlings of every known endemic woody plant of the central and northern part of the country. Those from the extreme southern part will not be able to bear the cold of New England winters. In addition to these recent introductions, fruits of Wilson's last journey in the orient, there are growing in the Arboretum all the trees and shrubs which, growing in the colder parts of Korea, occur also in northern Japan, eastern Siberia, Mongolia and northern China.

Azaleas. The flowers of two other eastern American Azaleas open their flowers before those of *Rhododendron (Azalea) Vaseyi* have faded. They are *R. canescens* and *R. nudiflorum*. These plants have rose-pink, fragrant flowers which open before or just as the leaves begin to unfold. The former is a northern plant common in some parts of southern New Hampshire and northern Massachusetts; the latter is more southern, ranging to Florida and Texas. Both these Azaleas take kindly to cultivation, and this year are covered with flowers in the Arboretum. They can be seen on Azalea Path, and there is a good mass of the northern plant on the right-hand side of the Meadow Road in front of the Lindens which makes itself known for a long distance by the exquisite fragrance of the flowers. *Rhododendron (Azalea) japonicum* is just beginning to flower. This is a hardy plant with flame-colored flowers three inches across. Less spectacular than the red-flowered *R. Kaempferi*, for many persons it is a more attractive plant and the handsomest of the Japanese Azaleas. Japanese gardeners have recently found forms of this Azalea with yellow flowers in different shades which promise to be good garden plants.

Bush Honeysuckles. For northern gardens there are no more beautiful plants than some of the Bush Honeysuckles, with their myriads of yellow, white, rose color or red flowers which in summer or autumn are followed by lustrous, usually scarlet fruits. Nearly all of these shrubs are able to show their greatest beauty in this climate, but this can be obtained only by planting them in rich soil and with sufficient space for free growth in all directions. In poor soil and when crowded by other plants they are usually miserable objects. The large growing kinds like the different forms of *L. tatarica*, the hybrids *L. bella* and its varieties with white and with rose-colored flowers, and *L. notha*, should be planted as isolated specimens at least twenty feet from any other plant. *L. Morrowi*, a plant of the Amoor region in eastern Siberia, requires even more space, for its lower branches which cling close to the ground naturally spread over a great area. This shrub has gray-green foliage, comparatively large white flowers and bright red fruits. It is one of the most useful of the early introductions of the Arboretum into the United States and has been largely planted in the Boston Parks. Like many other Bush Honeysuckles, *L. Morrowi* hybridizes easily with other species, and most of the plants raised from seeds, now sold by American nurserymen as *L. Morrowi*, are hybrids of this species with *L. tatarica* and are erect growing plants of little value for those who want plants with the peculiar habit of *L. Morrowi*. Among the less vigorous growing plants attention is called to two hybrids of *L. Korolkowi* in the collection, *L. amoena* and *L. Arnoldiana*. These have small gray-green foliage and small, bright pink and very attractive flowers, and are, perhaps, not surpassed in grace and beauty by any Honeysuckles in the collection.

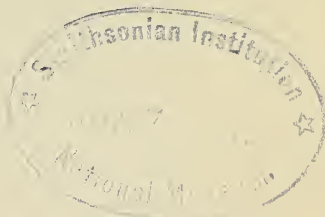
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NEW SERIES VOL. V

NO. 7

ARNOLD ARBORETUM

HARVARD UNIVERSITY



BULLETIN

OF

POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 5, 1919

Rhododendrons. The flowers of some of the early flowering evergreen Rhododendrons have already faded and those of *R. maximum* will not be in bloom for several weeks, but when this Bulletin reaches its Massachusetts readers a large number of the varieties of the Catawbiense hybrids will be in flower; and these plants are carrying this year an exceptionally large number of flower-buds. Of the species of evergreen Rhododendrons only the eastern American *R. maximum*, *R. catawbiense*, *R. carolinianum*, the mountain form of *R. minus*, the Caucasian *R. Smirnovii* and *R. caucasicum*, at least in some of its forms, are truly hardy in Massachusetts. The two species of the European Alps, *R. hirsutum* and *R. ferrugineum* can live here sometimes for a number of years but they are usually short-lived and unsatisfactory plants in this climate. The Japanese *R. brachycarpum* formerly lived in Massachusetts gardens for many years and longer trials will probably show that it can be successfully cultivated in this climate. Including this still doubtful Japanese species and the two little European species, there are only nine species of this great genus of several hundred species hardy in this climate, and there is little hope that another species able to support this climate will be found. The poverty of our gardens in these plants appears when the Arboretum collection is compared with that in a garden in Cornwall in England, in which some three hundred and sixty species of these plants are growing and in which on a day in May of this year sixty-five species were in flower. Such a collection, and perhaps even a better one, can be made in a garden in the neighborhood of Portland, Oregon, or in some favorable place on the shores of Puget Sound, but the sooner it is real-

ized that northeastern North America is not a good *Rhododendron* country in any broad sense the better it will be for the gardens in this part of the United States. For the last seventy years a large amount of thought, labor and money have been expended in attempts to cultivate these plants in the New England and Middle States; during this time many hundreds of thousands of these plants, principally hybrids of the American *R. catawbiense*, have been imported from Europe but the collections of *Rhododendrons* in the eastern states at all satisfactory or comprehensive can be counted on the fingers of one hand. In this climate unfortunately only a few of the *Catawbiense* hybrids, which are the popular *Rhododendrons* here, can be grown. The American parent of these hybrids is perfectly hardy, but the influence of the tender Himalayan species with which it has been crossed has made most of the varieties of this hybrid unsuited to this climate. The influence of the tender *R. ponticum*, the stock on which these plants have been almost universally grafted in European nurseries may account in part for the fact that plants of these hybrids which have lived here for thirty or forty years have then died without any other apparent cause. If evergreen *Rhododendrons* are ever to become hardy and permanent features of eastern gardens we must give up trying to make European-grown plants successful here, and confine our efforts to the few species which are hardy here and to crossing these among themselves in the hope of obtaining hybrids which will be able to grow here permanently. Something can perhaps be accomplished by the selection of seedlings. For example the flowers of *R. catawbiense* are of a peculiar shade of magenta which does not harmonize with any other color but white. Comparatively few seedlings, however, of *R. catawbiense* have ever been raised and probably not much attention has ever been paid to selecting from among the plants growing on the high Appalachian peaks individuals with flowers of unusual colors. *R. catawbiense* is perhaps the hardiest here of all *Rhododendrons*; the habit is excellent and the leaves are handsomer than those of the other hardy species. Improvement in the color of the flower is all that is needed to make it a first-rate plant for this climate. It is doubtful if this can be accomplished by crossing it with other species, but through patient selection it may be improved and possibly a white-flowered form discovered. Hybrid *Rhododendrons* are hardier or less hardy than their parents. The few hybrids which have been made between *R. catawbiense* and *R. maximum*, the hardiest of all *Rhododendrons* here, are less hardy than their parents; and only a few of the hybrids of *R. catawbiense* with *R. arboreum* and other Himalayan species are hardy. On the other hand by crossing some of the *Catawbiense* hybrids with *R. Metternichii*, a delicate Japanese shrub, a race of hybrids has been produced in England which is quite hardy in the Arboretum; and the hybrids of the two species of the European Alps crossed with one of the forms of the American *R. minus* are excellent dwarf garden plants here. In this country the breeding of *Rhododendrons* for American gardens has never been systematically undertaken with full knowledge of the species available for the purpose. The field is an inviting one, for these plants and other hardy broad-leaved evergreens are greatly needed in American gardens.

Chinese Lilacs. Most of the Chinese Lilacs have the advantage of flowering later than the common Lilac (*Syringa vulgaris*). Several of

the species recently discovered in central and western China are now established in the Arboretum, and, flowering more freely as the plants grow older now begin to show their true value as garden plants in this climate. Perhaps the most distinct and certainly the most unusual of these Lilacs is *Syringa reflexa*. On this plant the flower-cluster is compact, cylindric, unbranched, from an inch to an inch and a quarter in diameter, long stalked and is gracefully arching and reflexed. The flowers are deep rose-color with a long slender corolla-tube, and have the disagreeable odor, although to a less degree than those of the Chinese *Syringa villosa* to which this species and the next are closely related, as is shown in their ample leaves dark green on the upper surface and somewhat pale, and slightly hairy on the lower surface. The other species in this group now in flower, *Syringa Sargentiana*, differs in its rather paler flowers white on the inner surface of the lobes of the corolla, and arranged in large, loose, long-branched, erect or spreading clusters sometimes eighteen inches long and twelve inches across. The leaves of this plant are hardly distinguishable from those of *S. reflexa*. Five of these new Lilacs belonging to the group of which *Syringa pubescens* may be taken as the type are flowering freely this year; they all have fragrant flowers, although less fragrant than those of *S. pubescens*, and slender corolla-tubes. *Syringa Koehneana*, which is probably a native of Korea, has broad leaves unusually large for a species in this group, and short, broad, compact clusters of flowers which are pale rose-color on the outside of the corolla-tubes and pure white on the inner surface of the corolla-lobes. On *Syringa yunnanensis* from southwestern China, which is a narrow shrub with erect stems and branches, the flowers are produced in narrow, branched, erect clusters and are white faintly tinged with rose and very fragrant. *Syringa tomentella*, of which *S. Wilsonii* is a synonym, is a larger and more vigorous plant with erect stems, dull green leaves, and open branched panicles of the palest rose-colored flowers with rather thicker corolla-tubes than those of the other species of this group. *Syringa microphylla*, so named for its small dark green leaves, is flowering this year more freely than it has in the Arboretum before; the flowers are small, with narrow corolla-tubes, and are pleasantly fragrant. Unlike other Lilacs, *S. microphylla* has in previous years flowered again in October. *S. Sweginzowii* is covered with flowers again this spring, as it has been now for several seasons. It is a tall shrub with dull green leaves and narrow clusters of fragrant flowers half an inch long, flesh-colored in the bud, becoming nearly white after the flowers open. This species blooms freely as a small plant, and is perhaps the most attractive of the new Lilacs with slender corolla-tubes, although it does not equal in beauty and fragrance *S. pubescens*, which has been an inhabitant of the Arboretum for a quarter of a century.

Rosa sertata. There is now flowering in the Shrub Collection a plant of the northern form of this Chinese Rose which at this writing is one of the most charming plants in the Arboretum. It is a bush three feet high with slender gracefully spreading and arching stems which form an open head six feet across. The leaves are now only about an inch long with seven minute leaflets. The flowers are solitary or rarely in pairs on the ends of short lateral branchlets crowded from end to end on the branches, and are rather less than three-quarters of an inch in diameter with light pure pink petals, and are slightly fragrant.

Scotch Roses. Some of the varieties of the Scotch Rose (*R. spinosissima*) are distinct and beautiful garden plants. The handsomest, perhaps, are the variety *altaica*, also sometimes called var. *grandiflora*, with petals faintly tinged with yellow toward their base, the varieties *hispida* and *lutea* with yellow flowers, and the variety *fulgens* with pale pink flowers. Like most single Rose-flowers, the flowers of these Scotch Roses last only a few days, but during these few days they are delightful additions to the Rose-garden; they all have stems covered with prickles, rather small leaves and comparatively large black shining fruits.

Neillia sinensis is blooming again this year. The flowers of this *Neillia* are cylindric, clear pale pink, nearly half an inch long, and hang down on slender stems in long, one-sided racemes terminal on short lateral branchlets, and do not open until the small dark green leaves have grown nearly to their full size. It is one of the new Chinese plants which seem destined to become popular in American gardens.

Kolkwitzia amabilis. The plant of this shrub in the collection of Chinese plants on Bussey Hill is now well worth a visit, for *Kolkwitzia* has not before flowered so abundantly in the Arboretum. It is the only representative of a genus which is related to *Diervilla* and *Abelia*. The flowers are borne in pairs on long stems at the ends of short lateral branchlets and are rose-color in the bud, becoming paler after opening, the inner surface of the three divisions of the lower lobe of the corolla being white blotched with orange color at the base. *Kolkwitzia* did not begin to flower until it had been several years in the Arboretum, and it has not always, especially in the Shrub Collection, proved perfectly hardy here. A plant, however, like the one now on Bussey Hill, will make up for many disappointments.

Spirea Miyabei. This Chinese shrub, although less beautiful than *S. Veitchii* and *S. Henryi*, which are the handsomest of the new Chinese plants in this genus, flowers earlier than they do and is distinct in its flat or slightly convex clusters of white flowers which are terminal on erect, leafy, lateral branchlets three or four inches long, and quite cover the plants.

Viburnum Lentago. There are probably several hundred Asiatic and other exotic trees and shrubs now blooming in the Arboretum but this week the Arboretum is indebted for its greatest beauty to none of these but to the Nannyberry, *Viburnum Lentago*, one of the commonest shrubs or small trees which grow naturally by the sides of Massachusetts roads and the borders of Massachusetts woodlands. The Nannyberry has been largely planted in the Arboretum and it has responded to generous treatment and good care, and there are now many large specimens in the mixed plantations, which are now covered with their broad convex clusters of nearly white flowers rising above the bright green leaves. These later will grow thick and become lustrous, and will turn deep wine-color in the autumn when the plants will bear great crops of dark blue-black fruits hanging gracefully in red-stemmed clusters. In habit, foliage, flowers and fruit no *Viburnum* is handsomer than this common native plant, and three-quarters or more of the exotic species cannot as ornamental plants be compared with it. Fortunately *Viburnum Lentago* can now be found in several American nurseries.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

BULLETIN
OF
POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JUNE 12, 1919

Philadelphus. Gardens old and new owe much to this genus. In New England gardens of more than a century ago it was one of the chief ornaments and with the Lilac and a few old-fashioned Roses, the Syringa or Mock Orange (*Philadelphus coronarius*), was loved and carefully tended; and in our modern gardens there are few plants which produce more delightful flowers than some of the Syringas make in recent years by the art of the plant breeder. There are now established in the Arboretum some thirty species of *Philadelphus* and a large number of varieties and hybrids. All these plants, popularly called Syringas, are easy to manage, demand no special care, and suffer less from the attacks of insects than most trees and shrubs. They flower freely year after year, their flowers are often very fragrant, and in rich, well-drained soil the plants live for a long time. Some of the species can grow under the shade of overhanging trees, and flower in such situations more freely than almost any other shrub. The beauty of these plants is found in their white flowers; the fruit, which is a dry capsule, has as little beauty as that of a Lilac; there is nothing distinct or particularly interesting in the habit of the plants of any of the species, and the leaves fall in autumn without brilliant coloring. As flowering plants not many shrubs, however, surpass them in beauty, and their value is increased by the length of the flowering season which extends in the Arboretum during fully six weeks. The first *Philadelphus* to flower in the Arboretum opened its flowers several days ago; it is from Korea (*P. Schenkii* var. *Jackii*), and is a tall narrow shrub with erect stems and flowers of medium size, and is of no

exceptional value as an ornamental plant. Almost as early to flower is *P. hirsutus* from the southern Appalachian Mountain region. This is one of the smallest flowered species and in the Arboretum is a large loose-growing shrub of unattractive habit, and of comparatively little value as a garden plant. It is to be regretted that the *Syringa* of old gardens (*P. coronarius*) has been pushed aside by newer introductions and has become comparatively rare in at least this part of the country, for the flowers of no other *Syringa* have a more delicate and delightful perfume. This plant, which is a native of western Europe, reached England before the end of the sixteenth century, and was probably one of the first shrubs which the English emigrants brought with them to this country. Among the American species which should find a place in all gardens are *P. inodorus*, *P. pubescens* and *P. microphyllus*. The first is a native of the Appalachian Mountain Region and grows to the height of six feet; it has arching branches and large, solitary, pure white, cup-shaped, scentless flowers. By some persons it is considered the most beautiful of all *Syringas*. *P. pubescens*, often called *P. grandiflorus* or *P. latifolius*, is also a plant of the southern Appalachian region. It often grows to the height of twenty feet; the branches are stout and erect, the leaves are broad, and the slightly fragrant flowers are arranged in erect, from five- to ten-flowered racemes. This plant is more common in gardens than the last and when it is in bloom it makes a great show. *P. microphyllus*, which rarely grows more than three feet tall, has slender stems, and leaves and flowers smaller than those of any *Philadelphus* in cultivation. What the flowers lack in size, however, is made up in fragrance which is stronger than that of any other *Syringa* and perfumes the air for a long distance. The most distinct and the handsomest of the Asiatic species in the Arboretum is *Philadelphus purpurascens*, discovered by Wilson in western China. It is a large shrub with long arching stems from which rise numerous branchlets from four to six inches long and spreading at right angles; on these branchlets the flowers are borne on drooping stalks; they are an inch and a half long, with a bright purple calyx and pure white petals which do not spread as they do on most of the species but form a bell-shaped corolla and are exceedingly fragrant. This is one of the handsomest of the shrubs brought from western China to the Arboretum. *Philadelphus pekinensis* from northern China and Mongolia is a stout bush rather broader than high which every year produces great quantities of small flowers tinged with yellow. Another interesting garden plant, *P. Falconerii*, which is certainly Asiatic and probably Japanese, has narrow lanceolate leaves and fragrant flowers in from one- to six-flowered racemes, and is distinct in the shape of its leaves and in its long narrow petals. The origin and history of this plant is not known. Some of the species hybridize freely and several of the handsomest of these plants are hybrids. One of the first of these hybrids to attract attention was raised in France before 1870 by Monsieur A. Billard; it is known as *Philadelphus insignis* and sometimes is called *Souvenir de Billard*. It is one of the handsomest of the large-growing *Syringas*, and the last or nearly the last to bloom in the Arboretum, for the flowers will not be open for another month. A hybrid probably between *P. grandiflorus* of the Appalachian Mountain region with a species from our northwest coast appeared in the Arboretum a

few years ago and has been named *P. splendens*; it is a large and vigorous shrub with unusually large flowers, and one of the handsomest Syringas in the collection. *Philadelphus maximus*, a supposed hybrid between *P. latifolius* from the southeastern United States, and *P. tomentosus* from the Himalayas, grows to a larger size than any of the other Syringas. It is not rare in old Massachusetts gardens in which plants from twenty to thirty feet high can occasionally be seen. The crossing about thirty years ago in France by Lemoine of *P. coronarius* with *P. microphyllus* has produced an entirely new race of Syringas which has proved to be one of the best additions to garden shrubs that has ever been made. The first plant obtained by this cross is called *Philadelphus Lemoinei*; it is a perfectly hardy shrub four or five feet high and broad, with slender stems which bend from the weight of countless flowers; these are intermediate in size between those of the two parents and retain the fragrance of *P. microphyllus*. There are at least a dozen distinct forms of this hybrid made by Lemoine, varying considerably in the size of the plants and of the flowers, and in the time of flowering. One of the handsomest, perhaps, is called *Candelabre*; this is a very dwarf plant with flowers larger than those of either of its parents and an inch and a half wide, with petals notched on the margins, and without the perfume of its parents. Other distinct forms equally hardy and beautiful are *Avalanche*, *Boule d'Argent*, *Bouquet Blanc*, *Erectus*, *Fantasie*, *Gerbe de Neige* and *Mont Blanc*.

Some interesting Roses. The Boursault Rose (*Rosa Lheritieranea*) has not before carried more flowers than it has borne this year. This Rose, which was raised in France early in the last century, is believed to be a hybrid of *R. chinensis* and the European *R. pendulina*, and owes its popular name to Monsieur Boursault who a hundred years ago had a garden in the Rue Blanche, now Chaussée d'Antin, famous for its collection of Roses. There have been several forms of the Boursault Rose, the one in the Arboretum collection, which has pale rose red, partly double flowers, is not an uncommon plant in old New England gardens. It is a tall, vigorous and perfectly hardy shrub with gracefully spreading stems. *Rosa Marretii* has not before flowered so freely in the Arboretum; it is a tall broad shrub with arching stems, pale green leaves, and large pink flowers. It is a native of northern Hokkaido and of Saghalien where it was discovered by the late Abbé Faurie who sent seeds to the Arboretum in 1908. This plant, which is probably still rare in cultivation, promises to be a good addition to the single-flowered Roses which can be successfully grown in this climate. The single-flowered Chinese form of *R. Roxburgii* (var. *normalis*) is flowering this week for the first time in the Arboretum and proves to have larger flowers than any other Rose in the collection, with the exception of *R. rugosa* and its varieties. The petals are pale shell pink and conspicuously notched at apex. The fruit of this Rose will probably be almost as ornamental as the flowers, as it is bright red, and thickly beset with long sharp prickles. One of the hardiest and best growing of the new Roses, *Rosa bella*, raised at the Arboretum from seeds collected by Purdom in northern China, is a plant which when better known will be popular. It is a large shrub with bright red flowers an inch and a half in diameter, and showy red fruit. The only plant in the collection is with the other Chinese Roses on Bussey Hill. Unfor-

tunately the flowers were ruined as they opened by the excessive heat of last week. *Rosa multiflora cathayensis* is again covered with its great clusters of pink flowers and expanding flower-buds. The Chinese representatives of the white-flowered *R. multiflora* of Japan, it is one of the most beautiful Roses of its class, and interesting as the wild type from which the Chinese derived the now well known Crimson Rambler Rose and another old-fashioned garden plant, the Seven Sisters Rose (*Rosa multiflora platyphylla*). *Rosa Helenae*, which some persons consider the handsomest of the Roses discovered by Wilson in western China, will be in flower again in a few days. It is a large shrub with slender arching stems furnished sparingly with small red spines and many-flowered clusters of pure white delicately fragrant flowers an inch and a quarter in diameter. It well deserves a place in any collection of single-flowered Roses, however small.

Rhododendron (Azalea) calendulaceum. A lover of flowers who has had the good fortune to see the yellow-flowered Azalea in June on the wooded slopes of the southern Appalachian Mountains can never forget it. North America does not offer a more beautiful flower show. No other North American shrub has such brilliantly colored flowers; and no other Azalea hardy in New England can be compared with it in the variety of color found in its flowers. The flowers of the Korean *Azalea Schlippenbachii* are larger and more delicate in texture and color, and those of the Japanese *A. Kaempferi* are more surprising, for it is always a surprise to find the bright red flowers of this Azalea on a bare New England hillside. These plants when they are in flower look exotic here and do not fit our American surroundings as well as our yellow-flowered plant. The flowers, too, of the American plant remain in good condition longer than those of any of the Asiatic Azaleas, and they were not injured by the excessive heat of last week which spoiled the flowers of many other plants. A good many plants of *R. calendulaceum* have been raised at the Arboretum from seed, and many of the seedlings which are now blooming on Azalea Path show the variation in the color of the flowers from clear yellow to flame, which adds to the interest of a collection of these plants in early June. Single plants of this Azalea have also been planted among other shrubs on the borders of some of the drives, and these show how this Azalea can be used with advantage in New England plantations.

The Climbing Hydrangea (*Hydranga petiolaris*), which made last summer a large growth on the Administration Building, is as thickly covered with its broad flower clusters now as it has been in previous years. It is still the only climbing plant with conspicuous flowers able to attach itself firmly to a stone or brick wall, which can be grown in this climate. The fact that it is one of the first plants here to unfold its leaves adds to its value as a cover for the walls of buildings.

Laurels (*Kalmia latifolia*). When this number of the Bulletin reaches its Massachusetts readers the Laurels at the northern base of Hemlock Hill will be in bloom and never before have these plants been so thickly covered with flowers. They furnish the last and for many persons the most beautiful of the great Arboretum flower displays of the year.

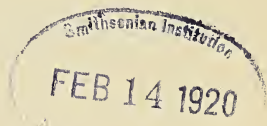
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Cornus kousa. This is the eastern Asiatic representative of the Flowering Dogwood of the eastern states (*Cornus florida*) and of the Flowering Dogwood of the northwest (*Cornus Nuttallii*). *Cornus kousa* was one of the Japanese plants which reached the United States in the early years of Japanese plant introduction into this country and although it has never become common in American gardens it is occasionally seen in the neighborhood of Boston and New York. The white bracts which surround the head of flowers and are the conspicuous feature of the inflorescence of all the Cornels of this group are narrowed and placed further apart on *Cornus kousa* than on our eastern Flowering Dogwood, and are long-pointed, and not as in the American plant rounded or emarginate at the apex. On the American plant the end of the bract is often discolored, while in the Asiatic plant the bracts are pure white to the tips. The flower-buds of *Cornus florida* are often killed here at the north in severe winters, but the extreme cold of the winter of 1917-18 did not injure those of *C. kousa*. The Japanese plants bloom several weeks later than *Cornus florida* and when the leaves are nearly fully grown. In Japan *Cornus kousa* sometimes becomes a small tree with a single trunk, but in this country so far as we have observed it grows always as a shrub with several erect stems. *Cornus kousa* was found in central China by Wilson and plants raised from his Chinese seeds are established in the Arboretum. They are handsomer than the Japanese form, with longer and broader floral bracts set closer together and often overlapping below the middle. On the largest plant in the Arboretum the head of bracts is four inches and a half across, but in China Wilson measured them

five inches across. On the Japanese plants the heads of bracts are rarely three inches and a half in diameter. The Chinese plant flowered in the Arboretum for the first time two years ago, and the flower-buds have never been injured by cold. It is flowering more freely this year than it has before and is now an object of much beauty. Like the Japanese plant the Chinese *Cornus kousa* has grown here as a shrub, but there seems no reason why it cannot be trained into a tree, as in China it is a small tree with a trunk sometimes a foot in diameter. If it fails to produce seed here the Chinese plant can probably be grafted successfully on *Cornus florida*. Although the Asiatic flowering Dogwoods do not make such a display of flowers as our American trees, their flower-buds are hardier judging by the effects of the winter of 1917-18, and if the future confirms this they will flower further north than *Cornus florida*. The fact that they bloom when the leaves are nearly fully grown and when the flowering time of most trees is over makes these Asiatic Cornels valuable, and it now seems probable that in the Chinese form of *Cornus kousa* the northern states have an important ornamental tree. The Japanese and Chinese plants are now in bloom, the former on Hickory Path near Centre Street and the latter with the other Chinese plants on Bussey Hill.

Aesculus turbinata, the Japanese Horsechestnut, first came to the Arboretum from France in 1881; this plant was lost, and in 1893 it was raised from seeds collected in Japan by Professor Sargent. These plants were also lost, but another supply was raised in 1900 from seeds produced by the fine specimen in the nursery of Ellwanger & Barry in Rochester, New York, and one of these plants has flowered this year. In Japan this Horsechestnut is a magnificent tree, often growing to a height of eighty or ninety feet and forming a tall trunk occasionally seven feet in diameter. Like the European Horsechestnut the leaves are composed of seven leaflets, but these are thinner and more lustrous, and the leaf-stalks are longer. The Japanese tree in summer therefore appears less dark and massive than the common Horsechestnut. The flower-clusters are narrower and the flowers, which are white with scarlet markings at the base of the petals, are handsomer. *Aesculus turbinata*, which grows to its largest size in central and northern Japan, is perfectly hardy in New England. Time only can show if it is able to live as long and grow to as large a size here as in its native country. If it succeeds here as the Horsechestnut of the mountains of Greece has succeeded during the last hundred years it will prove to be one of the handsomest exotic trees which has been planted in eastern North America. *Aesculus turbinata* is one of the five largest deciduous leaved trees of eastern Asia. The others are *Cercidiphyllum japonicum*, *Populus Maximowiczii*, *Acanthopanax ricinifolium*, and *Zelkova serrata*. These five trees are now established in the Arboretum.

Early Flowering Hydrangeas. The first Hydrangea to flower in the Arboretum is the so-called climbing Hydrangea, *H. petiolaris*, which has been covered with flowers during the past ten days. A few days later the plants in a group of shrubby Chinese species opened their flowers which are arranged in broad flat-topped clusters surrounded by a ring of large, pure white ray flowers. The best known of these plants, *Hydrangea Bretschneideri*, a native of the mountains

near Pekin, was first raised in the Arboretum thirty-seven years ago. It is a large, vigorous, hardy plant, with dark green leaves, and one of the best of the exotic shrubs which flower here the middle of June. Closely related to it are *Hydrangea xanthoneura* and its varieties *Wilsonii* and *setchuensis*, and *H. Rosthornii* raised here from seed collected by Wilson in western China. These plants are hardy and can now be seen covered with flowers in the collection of Chinese shrubs on Bussey Hill and on Hickory Path near Centre Street. As garden plants they do not appear to be in any way superior to *H. Bretschneideri*.

Rosa caudata is unfolding its pale pink petals which are nearly white toward the base. It is a large, strong-growing, hardy shrub with stout arching stems, dark green leaves, and flowers two inches in diameter, in wide clusters, each containing from twenty to twenty-five flowers. The fruit is orange red, an inch long, contracted above into a narrow neck crowned by the much enlarged calyx-lobes. It flowers at the same time as *Rosa Helenae*, and these two species, and *R. multiflora* var. *cathayensis*, are perhaps the handsomest of the Roses discovered by Wilson in western China.

Indigofera Potaninii. This beautiful little shrub from northern China is blooming again in the collection on Bussey Hill. As it grows here it is from three to four feet high, with a single stem and slender erect branches. The flowers are bright rose-color, half an inch long, in long-stalked, erect and spreading racemes from two to three inches in length. The flowers are of the same color, but are larger than those of *Indigofera amblyantha* which Wilson found in western China, and which until *I. Potaninii* bloomed in the Arboretum was considered the handsomest shrubby species which can be grown here.

Viburnum cassinoides adds much to the beauty of the Arboretum the middle of June. It is a native of swamps in the northeastern part of the country where it sometimes grows twenty feet high with slender straggling stems. In cultivation it forms a broad, low, round-topped bush, and has proved one of the handsomest of all the *Viburnums* introduced into the Arboretum. The leaves are thick and lustrous and vary greatly in size and shape. The flowers are slightly tinged with yellow and are borne in wide slightly convex clusters which also vary greatly in size. The fruit is larger than that of the other summer-flowering American *Viburnums*, and at first yellow-green later becomes pink, and finally blue-black and covered with a pale bloom, fruit of the three colors occurring in early autumn in the same cluster.

Magnolia glauca, or *virginiana* as botanists now want to call the Sweet Bay in the Magnolia Collection on the right-hand side of the Jamaica Plain entrance, is again covered with flowers. Often a large tree at the south, at the north this Magnolia is never more than a small tree, or more often a large shrub. The leaves are dark green and very lustrous on the upper surface and silvery-white on the lower surface; the flowers are small, cup-shaped, creamy-white and delightfully fragrant, and continue to open in succession from the middle of June until August. In all North America there is not a more delightful shrub to plant in the garden, or one that will give larger returns in beauty and fragrance; yet it is difficult to find it in any quantity in American nurseries, and it is unknown to most American planters of this gen-

eration. A hybrid, *M. major*, often called *M. Thompsoniana*, between *M. glauca* and *M. tripetala*, another American species, has the general appearance of *M. glauca* but has larger leaves and larger fragrant flowers.

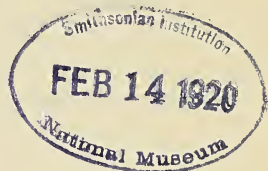
Halimodendron argenteum in the Shrub Collection is now covered with its pale rose-colored, pea-shaped, fragrant flowers which are borne in short clusters; their beauty is heightened by the light color of the leaves which are covered with pale silky hairs. This shrub or small tree remains in bloom during several weeks.

Cornus rugosa. Attention is called again to the value of this common native shrub for the decoration of parks and gardens where, like many other eastern American trees and shrubs, it is rarely seen. *C. rugosa*, or *C. circinata*, the name by which it is best known, is a shrub sometimes ten feet high which with plenty of space spreads into broad thickets. The young branches are green blotched with purple, becoming purple as they grow older. The leaves are broad, sometimes nearly circular, and dark bluish-green; the flowers are ivory-white, in compact clusters, and are followed in the early autumn by bright blue or nearly white fruits. This Cornel has been much planted in the Arboretum and is greatly improved by good cultivation. It can be seen in the Cornel Group at the junction of the Meadow and the Bussey Hill Roads; and the large individual plants, the great clumps on the right-hand side of the Bussey Hill Road beyond the Lilacs, and the masses among the Hickories in the groups of these trees show the value of this shrub in park planting when broad compact masses of foliage are needed.

The Tree Lilacs. As the flowers of the late-flowering group of Lilacs fade the earliest flowers of the so-called Tree Lilacs begin to open. There are three of these Lilacs which all bear large clusters of white or yellowish white flowers which have the disagreeable odor of the flowers of the Privet, and like those of the Privets the leaves fall in the autumn without change of color. The first of these plants to flower, *S. amurensis*, a native of eastern Siberia as its name implies, is a shrub in habit, twelve or fifteen feet high with dark close bark, broad thick leaves dark green above and pale below, and short, broad, unsymmetrical flower-clusters. *S. pekinensis* from northern China flowers next. This is also shrubby in habit, sometimes twenty or thirty feet tall and broad, with stout, spreading stems covered with yellow-brown bark separating readily into thin plates like that of some of the Birch-trees, dark green, narrow, pointed leaves and short and unsymmetrical flower-clusters usually in pairs at the ends of the branches. This species holds its leaves later in the autumn than the others, and produces great quantities of flowers every year, the other species usually flowering abundantly only every other year. The last of the Tree Lilacs to flower, *S. japonica*, is a native of northern Japan, and is really a tree sometimes forty feet high with a tall straight trunk covered with lustrous brown bark like the bark of a Cherry-tree, a round-topped head of upright branches, broad, thick, dark green leaves, and erect, mostly symmetrical flower-clusters from twelve to eighteen inches long. This is one of the handsomest of the small trees which bloom here at the end of June or early in July.

ARNOLD ARBORETUM

HARVARD UNIVERSITY

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Rosa rugosa, which is an old inhabitant of gardens, is a native of the coast sand-dunes of northeastern Asia from northern Japan to Kamtchatka. The thick dark green leaves seem able to resist the attacks of insects and the diseases which often discolor the leaves of many Roses. The flowers of the typical wild plant from Japan are red, but there are varieties with pure white and with clear pink flowers. The Kamtchatka plant, which is less ornamental than the Japanese plant, with smaller and thinner leaflets and smaller flowers is treated by many botanists as a species distinct from the Japanese plant and called by them *Rosa kamtschatica*. There is a double-flowered form of this continental plant in the Arboretum collection which produces flowers which are as ugly as it is possible that a Rose flower can become. No other Rose is hardier than *Rosa rugosa*, and left to itself it spreads into great thickets. No shrub is better suited to grow in exposed positions on the New England coast; it grows equally well in the rich soil of the garden, and no other Rose is so valuable in this climate for making low hedges. Valuable as the Japanese *Rosa rugosa* has proved itself as a garden plant its greatest value is in its ability to transmit its hardiness, handsome foliage and large flowers to its hybrid offspring. Among these are already several beautiful garden plants which suggest that the plant breeder who wishes to produce new races of Roses able to grow and flower successfully in the northern states must combine *Rosa rugosa* and its hybrids with other hardy Roses. Rose breeders are singularly reticent about the plants they have used in their work, and there appear to be no printed records of

the parentage of any of the *Rugosa* hybrids with the exception of the two which have been created in this Arboretum. One of the earliest of the *Rugosa* hybrids, Madam George Bruant, has pure white semi-double flowers which continue to open until the coming of frost. More distinct is the plant named Conrad Ferdinand Meyer which was raised in Germany. This is a large shrub, with large, nearly double, clustered pink flowers. The foliage and flowers show little *Rugosa* influence, but its vigor and hardiness are probably derived from the Japanese parent. Nova Zembla is a white-flowered sport of this Rose. At least twenty other European hybrids of *Rosa rugosa* have received names. Some of these are not distinct and others have little to recommend them as garden plants. One of the handsomest and most distinct of these hybrids was raised several years ago by Paul & Sons of Cheshunt, England, by whom it was named *Rosa rugosa repens alba*. This plant has the foliage of *Rosa rugosa*, large flowers with petals between which there is more space than in the typical flowers of *Rosa rugosa*, and long, stout, prostrate stems. In England standards with weeping branches have been successfully grown by budding this Rose on the tall stems of other Roses, and it would probably prove one of the hardiest standard Roses which could be grown here. It can be trained over a fence or arbor, but can be best used to cover banks and the ground under other shrubs or small trees. The Japanese *Rosa Wichuraiana* was at one time largely used as a ground cover in the Boston Parks, but it has not always proved hardy, and *Rosa rugosa repens alba* is a better ground cover in this climate. This Rose has been growing in the Arboretum for several years and has now been planted on the fence close to the entrance to the Arboretum nursery on Prince Street. The two *Rugosa* hybrids raised by Dawson at the Arboretum have proved to be good garden plants. In habit *Lady Duncan* resembles *R. rugosa repens alba* but the stems are not as stout; it can be used as ground cover or trained on an arbor or trellis. The flowers are rather smaller than those of *R. rugosa* and pure pink, and the leaflets are smaller and very lustrous. This Rose was obtained by crossing *Rosa rugosa* with *R. Wichuraiana*. The Arnold Rose, *R. Arnoldiana*, was made by Dawson, by crossing *R. rugosa* with the hybrid Tea Rose, General Jacqueminot. It is a stout bush with good foliage and large, bright red, single flowers, and when in bloom perhaps the showiest of the Roses in the Shrub Collection.

Deutzias. The climate of eastern Massachusetts is too severe for the successful cultivation of many of the handsomest of these plants which flower much better in the middle states and in Rochester, New York, than they do in the Arboretum. The mild winter has favored them, however, and several of the Chinese species have been flowering here in a way which shows what valuable garden plants they may be when climatic conditions suit them. The *Deutzia* which has proved perfectly hardy in the Arboretum in nearly thirty years of trial, the North China *D. parviflora*, is not one of the handsomest species, but crossed with the Japanese *D. gracilis* it has produced *D. Lemoinei* which has inherited much of the hardiness of its Chinese parent and proved to be an excellent garden plant here. It is a shrub sometimes

five or six feet tall and broad which every year about the middle of June covers itself with large clusters of pure white flowers. There are several smaller and more compact forms of this hybrid in the collection and they are all good garden plants. Another Chinese *Deutzia*, *D. hypoglauca*, is a handsomer plant than *D. parviflora* and, judging by its behavior in the Arboretum during the last three years, it is equally hardy. Another Chinese species, *D. grandiflora*, is the first of the genus to bloom here. It is a dwarf plant with large flowers in from one- to three-flowered clusters. Although known to botanists since 1832 it has only recently found its way into gardens through the agency of the Arboretum. Several Chinese species which have been injured in previous winters have been covered with flowers this summer and, if they could be depended on to flower as well every year, would be important additions to New England gardens. Among these Chinese species which have flowered here abundantly for the first time are *D. globosa*, *D. Wilsonii*, *D. discolor*, *D. discolor major* and *D. longifolia*. The last in one of its forms has been covered with large loose clusters of pale pink flowers and proves to be the handsomest of the new Chinese species, although *D. globosa* with its erect stems thickly covered toward the ends with clusters of pure white flowers has been almost as attractive.

Rhododendron (Azalea) arborescens. As the flowers of the yellow-flowered Appalachian Azalea (*R. calendulaceum*) begin to fade the first of those of *Azalea arborescens* open. This is a handsome plant, and the beauty of the pure white fragrant flowers is increased by the bright red color of the long filaments and style. This is also an Appalachian plant, and sometimes at an elevation of about 5,000 feet covers with dense thickets only a few feet high and sometimes an acre in extent the treeless summits of Blue Ridge Mountains, and in their sheltered valleys sometimes grows into great arborescent bushes twenty feet tall and so justifies its name.

A good combination. Two native plants, *Cornus racemosa* and *Rosa virginiana*, or, as it is often called, *R. lucida*, are in flower and the pure pink flowers of the Rose harmonize so well with the creamy white flowers of the Cornel that these two plants can well be used together in natural planting. *Rosa virginiana* is confined to the northeastern seaboard region of the continent, and in its best form is a tall shrub with lustrous leaves and pure pink flowers which now perfume the borders of the roads in some parts of the Arboretum. A beautiful floral display is also made when this Rose grows with the native Elder (*Sambucus canadensis*), as it does sometimes in the rear of Massachusetts sea cliffs.

Lonicera Giralddii. The attention of persons interested in climbing plants is called to this handsome Chinese Honeysuckle which is now flowering on the trellis in the Shrub Collection. It is remarkable in its narrow, long-pointed, dark green leaves, dark wine-colored, pubescent flowers with protruding pure white filaments and style. The flowers are produced in many-flowered clusters terminal on short leafy, axillary branchlets.

Cornus amomun, the Silky Cornel, which has been much used in the Arboretum, is now opening its flowers. In cultivation it is not a satisfactory plant unless it can be given sufficient room for its wide-spreading branches to extend freely over the ground. When crowded by other plants the branches become erect and it loses its real beauty and value. To be seen at its best this Cornel should have a clear space with a diameter of not less than twenty feet in which to spread. It is well suited for the front of groups of trees and shrubs, and there is no better shrub to plant by the margins of ponds and streams where its long branches can hang gracefully over the water. Its purple stems are attractive in winter, and the bright blue fruits which ripen in the autumn add to the value of this native shrub. In the Cornel Group, at the junction of the Meadow and the Bussey Hill Roads, there is a good specimen of this plant, and its value for planting near water can be seen on the border of the small pond in the rear of the Cornel Group.

Red-fruited Viburnums. With the exception of the species which belong to the *Opulus* Group no American Viburnums have red fruit, but in eastern Asia there are several red-fruited species. The handsomest of these in the Arboretum is *V. dilatatum*, which is a native of Japan, Korea, and western China. It is a large, shapely and vigorous shrub with broad, abruptly pointed leaves and wide flat clusters of flowers which are followed by small bright red fruits. This is a good shrub for the decoration of summer and Autumn gardens. The fruit is smaller and less showy than that of another red-fruited Japanese species, *V. Wrightii*. This is a smaller shrub and flowers earlier than *V. dilatatum*. The flower-clusters are smaller and the plants are not always perfectly hardy in exposed situations, but the fruit is larger and handsomer than that of the other red-fruited Viburnums of eastern Asia. Another of these plants, *V. theiferum*, from western China is not yet in flower. It is a tall narrow shrub with erect stems, small leaves and small flower-clusters. It has little to recommend it as a flowering plant but the fruit is large, abundant and of good color, and the plant has an economic interest as an infusion of the leaves is the "sweet tea" used by the monks of the monasteries on Mt. Omei, one of the five sacred mountains of China.

Potentilla fruticosa Veitchii. Nearly all the shrubby species of this genus and their hybrids are attractive plants with yellow, white or cream-colored flowers which look like miniature Roses. *P. fruticosa* is pretty generally distributed in most of the countries of the Northern Hemisphere, and in the western part of Massachusetts has now taken such possession of the ground that it has ruined hundreds of acres of upland pastures. The flowers are bright yellow, but on a variety from western China (var. *Veitchii*) the flowers are pure white. This is a dwarf shrub which blooms here freely every year, and the plants are covered during several weeks with flowers which begin to open at the the end of May. This plant can be seen in the Shrub Collection and with the other Chinese plants on Bussey Hill.

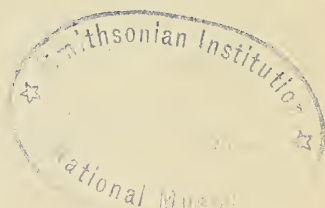
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Ash-trees. Several readers of these Bulletins have asked that something be said in them about Ash-trees. *Fraxinus* is the name of the genus to which all Ash-trees belong, although it may be well to say that the trees called Mountain Ashes are not Ashes but belong to the genus *Sorbus*, a member of the Rose Family and closely related to the Pears, Apples and Chokeberries. Ash-trees occur in nearly every temperate part of the Northern Hemisphere, but are more abundant in species in eastern North America than in other parts of the world. Ash-trees fall naturally into two groups; those of the first group are furnished with narrow white petals (*Ornus*) and the flowers of those in the second group are destitute of petals. The best known tree of the first group is the little tree called Manna Ash or Flowering Ash (*Fraxinus Ornus*) a native of southeastern Europe which has long been an inhabitant of the gardens of western Europe. It grows well in the middle Atlantic States, but has never been a success in the Arboretum where a tree which had flowered in 1917 was killed to the ground by the extreme cold of the following winter. Three of the flowering Ashes are natives of the United States, *Fraxinus cuspidata* and *F. Greggii* of the Mexican boundary region and *F. dipetala* of the mountain valleys of California. These three plants are not in the Arboretum collection where they would not be hardy, but *Ornus* is well represented here by two eastern Asiatic species, *Fraxinus Bungeana*, a small shrub from northern China which was first raised here in 1882, and by the Japanese *Fraxinus longicuspis* which grows in the Arboretum both as a shrub with several spreading stems and as a small tree. Of the Ash-trees without petals and therefore with inconspicuous

flowers there are seventeen species with a number of more or less distinct varieties which are natives of the United States. Six of these trees grow in the northeastern part of the country and three of them are common New England trees. To these trees color names have for no very obvious reason been given, at least in books, for it is doubtful if these names have any general application among persons whose knowledge of trees has come from an intimacy of association with them in the forest or by the roadside, and not from the study of other persons' ideas about them recorded in printed pages. To persons who know trees from books White Ash, Black Ash, Green Ash, Red Ash and Blue Ash are familiar names. The most valuable of the American Ashes as a timber tree and one of the handsomest of the whole genus, the so-called White Ash, *Fraxinus americana*, grows naturally from Nova Scotia to Florida and eastern Texas, and westward to Nebraska and Oklahoma. It is a splendid tree often, when conditions of soil and rainfall favor it more than one hundred feet high with a tall massive trunk five or six feet in diameter. If anyone in northeastern North America wants an Ash-tree for shade or to produce timber, *Fraxinus americana* is the tree to plant. It grows, too, better in western Europe than most eastern American trees, although it will probably not become as good a tree there as the native Ash. A variety of *Fraxinus americana* (var. *subcoriacea*) differs from the common form in its thicker, entire or only slightly toothed leaflets which are silvery white on their lower surface. This tree was raised at the Arboretum in 1874 from seeds collected at Mt. Victory in central Ohio. It is therefore now one of the oldest trees raised here. This Ohio tree has grown more rapidly and is handsomer than any other Ash-tree which has been planted in the Arboretum. Seeds of this tree usually reproduce the variety, and it is this variety which should be planted when the best possible Ash-tree is wanted in this part of the country. The Black Ash, *Fraxinus nigra*, grows as far north as Newfoundland and the shores of Lake Winnipeg, that is, further north than the other American Ash-trees, and is a common New England tree. It grows naturally in deep cold swamps and on the low banks of lakes and streams, and long resisted every effort made to establish it in the Arboretum until Mr. Dawson tried the experiment of grafting it on roots of the White Ash. These grafted plants although still small are growing well in peat soil on the left-hand side of the Meadow Road near the Rhamnus Collection. *Fraxinus pennsylvanica*, the so-called Red Ash, is another tree widely distributed over the eastern part of the continent from New Brunswick and southern Dakota southward. It is a smaller tree than the White Ash, rarely growing more than fifty or sixty feet tall, with a trunk less than two feet in diameter a narrow head of thin foliage, and branchlets covered with pubescence. The inner surface of the bark of this tree is sometimes red when first cut; the wood is about as valuable as that of the White Ash, but for shade or ornament *Fraxinus pennsylvanica* is not worth planting. The Green Ash is now usually considered a variety of *Fraxinus pennsylvanica* (var. *lanceolata*), and is most abundant in the valley of the Mississippi River and westward. It is easily distinguished by the bright green color of the two surfaces of the usually narrow leaflets. Seeds of the Green Ash germinate easily and quantities of seedling plants are found on the sand-bars and banks of many western

rivers. It is a popular tree, therefore, in western nurseries, and, although not suited for the purpose, has been largely planted in the west as a street and shade tree, and occasionally also in the east for American nurseries have often substituted it for the White Ash. Another Ash of the Mississippi Valley, the Blue Ash of popular tree books, *Fraxinus quadrangulata*, owes its scientific name to its four-angled branchlets. This is one of the noble trees of the American forest, almost rivalling the White Ash in size. This tree grows naturally in limestone soil, but it has grown well in the Arboretum where it is helped by occasional applications of lime. Two southern trees related to the White Ash, *Fraxinus biltmoria*, with densely pubescent branchlets, of the southern Appalachian region and westward, and *F. texensis* with rounded leaflets and a native of central and western Texas, are established in the Arboretum. Three species of the southeastern states and the five species of New Mexico and Arizona will probably never live very long in Massachusetts, although the curious little *Fraxinus anomala* with square branchlets and leaves usually reduced to a single leaflet at one time flourished in the Arboretum during several years. *Fraxinus oregona*, the Pacific coast Ash-tree, is a large and handsome tree and one of the few valuable deciduous-leaved timber trees of the northwest. It has proved hardy in the Arboretum where it grows well but where it will probably never become a large tree.

Of the Old-World Ash-trees the best known is *Fraxinus excelsior*, one of the important timber trees of the world, and as it grows in western and central Europe often a magnificent tree sometimes nearly one hundred and fifty feet high with a tall massive trunk three or four feet in diameter. A number of abnormal forms of this tree have appeared in European nurseries and plantations, but *F. excelsior* and its varieties are miserable trees in New England and should not be planted here. *Fraxinus rotundifolia* and its variety with pendulous branches are established in the Arboretum. They are small trees, natives of southern Europe and southwestern Asia, and although interesting from the botanists' point of view add little to the beauty of a collection of trees. An Ash-tree from Turkestan and Songaria (*F. potamo-phylla*) was raised at the Arboretum in 1878 and has grown rapidly into a handsome, shapely and hardy tree. As an ornamental tree this is the most promising of the exotic Ashes which have been planted in the Arboretum. The great Ash-tree of northeastern Asia, *Fraxinus mandshurica*, inhabits eastern Siberia, Manchuria, Korea, and northern Japan. It is a really splendid tree and produces wood of exceptionally good quality. This tree was first raised in the Arboretum in 1878. It is hardy and grows well for a few years but soon begins to fail and become unsightly, and no place has yet been found in the Arboretum which suits it. In 1882 the Arboretum received seeds from Peking of *Fraxinus chinensis* var. *rhyncophylla*; it has grown well and has now flowered and produced fertile seeds for several years. It is a small and not particularly shapely tree, and is most interesting in winter, for the buds are unlike those of other Ash-trees and are globose, half an inch in diameter with broad scales covered with a thick coat of rufous tomentum. The outer scales, which are smaller than the others, do not as in most Ash-trees cover the bud which is enclosed by the second pair of scales; and on the terminal bud these

outer scales are reduced to thickened reflex tips which stand out like ears. Several Ash-trees discovered by Wilson in western China have been raised at the Arboretum and are now growing in its nurseries. Of these *Fraxinus platypoda* has grown the most rapidly, but it is too soon to form an idea of the value of these trees in American plantations.

Ash-trees require deep, rich, moist soil and as they usually unfold their leaves late and lose them early in the autumn they are not good trees to plant to shade streets and sidewalks. They are often injured while young by borers, and they are all liable to suffer from the attacks of the oyster shell scale.

Rosa multibracteata is one of the last of the new Chinese Roses to flower. It is an attractive plant with small leaves and small flowers in clusters, the clear pale pink petals being deeply notched at the apex. Vigorous young shoots of this Rose are thickly covered with bright red prickles and greatly add to its beauty at the time when it is in flower.

Rosa gallica var. *officinalis* is flowering for the first time in the Arboretum. It is one of the Province Roses and is sometimes called *Rosa provincialis*. The large, handsome, partly double red flowers are more fragrant than those of most modern Roses. This Rose is common in several old gardens in the town of Medfield in this state. No one now knows when and by whom it was brought there. It has long been known in French gardens, and there is a beautiful picture of it by Redouté in his great work on Roses published in Paris more than a century ago. There is a form of this Rose with paler-colored flowers which is growing in a garden in Weston in this state which was brought from New Hampshire where it is said to be common in old gardens. Tradition credits the Huguenots with having brought this Rose to America.

Tripterygium Regelii is flowering well again this year in the Shrub Collection and on Hickory Path near Centre Street. It is a near relative of the Bitter Sweet (*Celastrus*) and a native of Japan and Korea. It is a half climbing shrub with stems sometimes forty or fifty feet long in its native countries, large, long-pointed, dark green leaves, and small white flowers in great terminal clusters which are followed by three-lobed and three-winged fruits. This plant flowered in the Arboretum when not more than three feet high. The small plants have erect, self-supporting stems, but large plants will need the support of trees, shrubs or rocks over which to stray. This hardy shrub is well suited for covering rocky banks or hillsides in our northern states.

Rhododendron (*Azalea*) *viscosum*, which is the latest of the Azaleas to flower in the Arboretum, is in bloom. It is a common plant in the swamps of southern New England where it is usually known as "Swamp Honeysuckle." The small, pure white, clammy flowers which continue to open during several weeks are hidden by the new shoots of the year which are often fully grown before the first flowers open, and the great value of this Azalea is found in the fragrance of the flowers which make the neighborhood of an Azalea swamp delightful. Although it grows naturally in swamps, this Azalea grows equally well transferred to a garden border or to a hillside, as on Azalea Path in the Arboretum where many of these plants are now covered with flowers.

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BULLETIN

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JAMAICA PLAIN, MASS.

JULY 17, 1919

Summer Flowering Trees. Several trees with handsome or interesting flowers bloom in the Arboretum in July and August. All these and many summer flowering shrubs should find a place in gardens which are chiefly used during July, August and September, that is in many northern seashore gardens. The most important of summer flowering trees here are the Lindens. Some of the species begin to flower about the middle of June, but in the Arboretum collection are Linden trees which are covered until the end of July with their beautiful fragrant flowers beloved of bees. In the meadow on the right-hand side of the Meadow Road there is a large collection of these trees with many species, hybrids and varieties. Among them are trees of great beauty of habit, and trees which can be successfully used in New England to shade streets and roads and to decorate parks. A careful study of the Linden collection in the Arboretum during June and July will repay lovers and planters of trees.

Koelreuteria paniculata. This Chinese tree will be in bloom when this number of the Bulletin reaches its readers. It can be seen on the right-hand side of the Meadow Road beyond the Evonymus Collection. Koelreuteria is a medium-sized tree with large, dark green compound leaves and large erect clusters of bright yellow flowers which are followed by conspicuous bladder-like fruits. This tree is now often planted in this country, especially in the middle states. In nursery catalogues it often appears as "The Japanese Lacquer-Tree," an absurd name, for it is not a Japanese tree and it does not produce lacquer.

The *Aralia* Family furnishes the Arboretum with three handsome trees which flower in late summer and early autumn. They are *Acanthopanax ricinifolium*, *Aralia spinosa* and *A. chinensis* and its varieties. The *Acanthopanax* is a tree which is common in the forests of northern Japan, Korea and China where it is often seventy or eighty feet high with a massive trunk and great wide-spreading branches armed, like the stems of young trees, with many stout prickles. The leaves hang down on long stalks and are nearly circular, five- or seven-lobed and often fifteen or sixteen inches in diameter. The small white flowers are produced in compact, long-stalked clusters which form a flat compound, terminal panicle from twelve to eighteen inches across and are followed late in the autumn by shining black fruits which do not fall until after the beginning of winter. This tree is perfectly hardy in the Arboretum where it has been growing for twenty-four years and where it has flowered and ripened its seeds now for several seasons. It is one of the most interesting trees in the collection and, because it is so unlike other trees of the northern hemisphere, it is often said to resemble a tree of the tropics. *Aralia spinosa*, the so-called Hercules' Club of the southern states where it is a common inhabitant of the borders of woods and the banks of streams, is a tree often thirty feet high with a tall trunk and wide-spreading branches covered with stout orange-colored prickles. The leaves, which are borne at the ends of the branches, are long-stalked, twice pinnate, and from three to four feet long and two and one-half feet wide. The small white flowers are arranged in compound clusters which rise singly or two or three together above the leaves and are three or four feet long. The fruit is black, rather less than a quarter of an inch in diameter, and ripens in early autumn. It is now well established on the slope at the northern base of Hemlock Hill in the rear of the Laurel plantation and is now spreading rapidly there over a considerable area by shoots from underground stems. The Asiatic tree *Aralia* resembles in habit and general appearance the American Hercules' Club, but is distinct from that tree in the absence of stalks to the leaflets. There are a number of geographical forms of this tree; the one which is most commonly cultivated in this country is a native of Manchuria and eastern Siberia (var. *mandshurica*) which is sometimes found in nurseries under the name of *Dimorphanthus mandshuricus*. The Japanese form (var. *glabrescens*) is chiefly distinguished from it by the pale color of the under surface of the leaflets; it is less hardy than the Manchurian form and is not often seen in this country.

Sophora japonica, sometimes called the Pagoda-tree, is in spite of its name a Chinese tree which has been cultivated in Japan for more than a thousand years, and as it first reached Europe from that country was long considered a native of Japan. It is a round-headed tree which in Peking, where it has been much planted, has grown to a large size and looks from a distance like an Oak-tree. The leaves and branchlets are dark green, and the small, creamy white, pea-shaped flowers, which open here in August, are produced in great numbers in narrow, erect, terminal clusters. There are also in the collection the form with long pendent branches (var. *pendula*) which rarely flowers, and a young plant of the form with erect branches (var. *pyramidalis*).

Oxydendrum arboreum, the Sour Wood or Sorrel-tree, so-called from the acrid taste of the leaves, is the only American tree in the Arboretum which flowers in August. It is a native of the Appalachian forests from southwestern Pennsylvania and is most common on mountain slopes, but reaches the coast of Virginia and North Carolina. The Sorrel-tree, which is perfectly hardy in New England, is a beautiful tree with bright green shining leaves which turn bright scarlet in the autumn, white Andromeda-like flowers erect on the branches of spreading or slightly drooping terminal clusters, and pale capsular fruits which in the autumn are conspicuous among the brilliant leaves. There is a group of these trees among the Laurels at the base of Hemlock Hill.

Summer Flowering Shrubs. Many shrubs with conspicuous flowers bloom in the Arboretum during the summer months. The list includes the Heathers (*Calluna vulgaris*), and several species of *Genista* and *Cytisus*. Of this European group the handsomest which can be grown here is the bright yellow-flowered *Cytisus nigricans*, the yellow-flowered *C. capitatus*, the white-flowered *C. leucanthus* and the yellow-flowered Woad Wax and its varieties (*Genista tinctoria*), too well known in Essex County, Massachusetts, where escaped from cultivation it has ruined many hundred acres of hillside pastures. The *Lespedezas* with their abundant purple, pea-shaped flowers, and the handsomest of the Chinese *Buddleias* are still to bloom, as is the very hardy *Acanthopanax sessiliflorum*, a vigorous shrub of eastern Siberia, most conspicuous in winter when the compact round clusters of the shining black fruits are on the ends of the branches. The Japanese *Hydrangea paniculata* and its varieties, and the *Hydrangeas* of North America produce here the showiest July and August flowers. The early-flowered forms of *Hydrangea paniculata* (var. *praecox*) which is the handsomest of the group, is already in flower; and all the American species are blooming or just opening their flower-buds. The most popular of these American plants is the form of *H. arborescens* (var. *grandiflora*) with snow-bail-like heads of white sterile flowers. There is a similar abnormal form of another of the American species, *H. cinerea*. More beautiful, and one of the handsomest of the genus, *H. quercifolia* will flower this month in the Shrub Collection. This is an unusual event for this shrub, which is a native of the southern states, is frequently killed to the ground here. In the middle and southern states it is an important and valued garden ornament. Of the American *Hydrangeas* which are perfectly hardy in the north the handsomest is *H. radiata*, a native of mountain slopes in North and South Carolina, once a popular garden plant but now rarely cultivated. It is a broad, round-topped shrub with leaves of ample size, dark green above and silvery white below, and broad flat heads of flowers surrounded by a ring of white neutral flowers.

Amorpha canescens, the Lead Plant, is beginning to open its small, violet-colored flowers arranged in long, narrow clustered spikes, which are conspicuous by the contrast with the color of the leaves and branches and are thickly covered white gray down. This plant is a native of the Mississippi valley where it grows on low prairies from Indiana and Minnesota to Texas.

Aesculus parviflora occupies an important place among summer flowering shrubs. This native of the southeastern states is hardy in the north, and with abundant space and in good soil will spread into great thickets with stems seven or eight feet high. Toward the end of July it will be covered with its tall, narrow, erect spikes of small white flowers which stand up well above the foliage.

Cornus paucinervis suffered somewhat in the cold winter of 1917-18, as was to have been expected, as it grows naturally at low levels in central China where the Orange flourishes and rarely ascends to altitudes of three thousand feet. It has recovered, however, and is now in flower. If it were a little hardier it would be one of the best summer flowering shrubs introduced by Wilson from China. It is a shrub five or six feet tall with erect stems, small, narrow, pointed leaves with only two or three pairs of prominent veins, small clusters of white flowers and black fruits.

July Roses. July is the month when the hybrid Rambler Roses bloom, especially those which have been largely influenced by the Japanese *Rosa Wichuraiana*, but in the Arboretum collection there are only four species which do not begin to flower until after the first of July. These in the order of the opening of their flowers this year are *R. stellata*, *R. Jackii*, *R. setigera* and *R. Wichuraiana*. *R. stellata*, which is a native of the mountains of southern New Mexico, is a comparatively new inhabitant of gardens, and one of the most interesting and distinct of American Roses. It is a shrub with slender, pale yellow stems armed with long slender spines of the same color, small leaves with thick, round, lustrous leaflets, which generally resemble the leaves of some western Gooseberry, and deep rose-colored, slightly cup-shaped flowers from two inches and a half to three inches in diameter. The fruit is dark red, nearly globose, covered with prickles, half an inch in diameter, and surmounted by the much enlarged calyx-lobes. *Rosa Jackii*, which is a native of Korea, and one of the Multiflorae Group, has long stems which lie nearly flat on the ground, lustrous leaves and pure white clustered flowers rather more than two inches in diameter. The flowers are larger than those of the Japanese *R. multiflora*, and open two or three weeks later. The Prairie Rose, *R. setigera*, is well known to the inhabitants of the middle states for it is a common prairie inhabitant from Michigan to Texas. It produces long slender stems which can be trained over an arbor or against a building, but this Rose looks best when allowed to grow naturally when it forms a wide bush of gracefully arching stems. The flowers are produced in wide, many-flowered clusters and are light rose pink. This is usually the last Rose to open its flowers in the Arboretum, but this year *Rosa Wichuraiana* is several days late. Its long prostrate stems are well suited to clothe banks which when the flowers open look as if they had been covered with snow. Grown in this natural way it is perfectly hardy, but when the stems are trained over an arbor or trellis they often suffer in New England from cold; and its hybrids, among which are found some of the most beautiful Rambler Roses, are less hardy here than those in which *Rosa multiflora* has been one of the parents.

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POPULAR INFORMATION

JAMAICA PLAIN, MASS.

JULY 26, 1919

Fruits in the Arboretum. The ripening and ripe fruits of many hardy trees and shrubs are as beautiful and often more beautiful than their flowers; and such plants have a double value for the decoration of northern gardens, especially the gardens of the northern United States. For the climate of this part of the world is suited for the abundant production and high coloring of the fruits of our native trees and shrubs and of those of northeastern Asia; and European plant lovers who come to the Arboretum in summer and autumn are always astonished and delighted with the abundance and beauty of the fruits they find here. The list of trees and shrubs with handsome fruits which can be grown in New England contains many species of Holly, Ribes, Viburnum, Cotoneaster, Cornus, Malus, Sorbus, Amelanchier, Aronia, Rosa, Prunus, Rhus, Crataegus, Ampelopsis, Berberis, Magnolia, Acer, Acanthopanax and Lonicera. On the Red and White Maples the fruit ripens early in May, and until the first of November there will be a succession here of ripening fruits. The fruits of a few trees and shrubs will remain on the branches and keep much of their brilliancy until early April, and there is therefore only a few weeks during the year when one cannot find showy fruits in the Arboretum.

Honeysuckles as fruit plants. It is not perhaps generally realized that the fruit of several Honeysuckles is more beautiful than their flowers, and that among the species which are bushes and not vines are plants perfectly suited to this northern climate which are not surpassed in the abundance and brilliancy of their fruits by any plants which ripen their fruit in summer. The Honeysuckles which produce the earliest and the showiest fruit are *Lonicera tatarica* and some of its hybrids. The Tartarian Honeysuckle, which is a native of western

Siberia and central Asia, is an old inhabitant of gardens and one of the best shrubs for cold countries, for it can support without injury the excessive cold of the long winter and the burning sun of the short summer of the north fatal to all but a few of the plants which decorate the gardens of more temperate regions. It cannot be too often repeated that the Tartarian Honeysuckle and its hybrids are large, fast-growing plants, that they only thrive in rich, well-drained soil, and that they can only show their real beauty when allowed sufficient space for free development of their branches. Twenty-five feet between the plants does not give them too much room. There are many varieties of the Tartarian Honeysuckle in the Arboretum collection varying in the color of their flowers and in the color of their fruits. The varieties of *L. tatarica* which have this year the handsome fruit are the var. *rosea* with scarlet fruit and var. *lutea* with bright yellow fruit. The fruits, however, of some of the hybrids are more beautiful than those of any of the varieties of the species. As fruiting plants the best of these hybrids which are in the Arboretum are *Lonicera bella*, *L. muendeniense*, *L. notha*, and *L. amoena*. *L. bella* was raised in the Botanic Garden at Petrograd and is believed to be the product of a cross between *L. tatarica* and the Japanese *L. Morrowii*. There are several varieties of this hybrid differing in the color of their flowers. They are large, free-flowering plants with large, lustrous red fruit. *L. muendeniense*, which originated in the Botanic Garden at Muenden, is probably of the same parentage as *L. bella* altered by the cross with another species. It is a very vigorous plant with large, lustrous, orange-red fruit. *L. notha*, which is believed to be a hybrid of *L. tatarica* and *L. Ruprechtiana*, is another large, vigorous, fast-growing plant with lustrous orange-red fruit. *L. notha* and *L. muendeniense* as fruit plants are the handsomest of the large-growing Bush Honeysuckles with dark green leaves and orange-red fruits. More beautiful when in flower is the hybrid of *L. tatarica* with the Persian *L. Korolkovii* which is called *L. amoena*. This is a smaller plant than the other hybrids of the Tartarian Honeysuckle with pale gray-green leaves, small pink flowers and small red fruits. When it is in bloom this plant is considered by many persons the most beautiful *Lonicera* in the collection. The Japanese *L. Morrowii* is more beautiful now when it is covered with its large orange-red fruits than it was when the yellow and white flowers were open in early spring. This is a round-topped shrub, much broader than high, with gray-green foliage, and long lower branches which cling close to the ground. When it can have sufficient room in which to grow this is one of the handsomest of the Honeysuckles and one of the best shrubs introduced into the United States by the Arboretum. There are two hybrids of this species in the collection, *L. minutiflora* with small, translucent, yellow fruit, and *L. muscaviense* with large bright scarlet fruit. They are large, hardy and fast-growing plants. Very different are the bright blue fruits of the different geographical forms of the widely distributed *Lonicera coerulea* which are now ripe. These fruits are beautiful but they are a good deal covered by the leaves, and the plants are not as conspicuous at this season of the year as the Tartarian and several of the other Bush Honeysuckles. The bright red fruit of *Lonicera trichosantha* is conspicuous in the last weeks of July. This is a shrub now three or four feet tall in the Arboretum, with erect stems, large yellow and white flowers, and fruits rather larger than those of the Tartarian

Honeysuckle. It is a native of northern and central China and promises to be a useful addition to summer fruiting shrubs. The fruits of two western American Bush Honeysuckles, *L. involucrata* and its varieties and *L. Ledebourii* ripen in July and are handsome and peculiar, for the large, lustrous black berries rise from the much enlarged bractlets of the flowers which are now bright red and much reflexed. One of the most interesting of these plants is the variety *serotina* of *Lonicera involucrata*. This has bright yellow flowers flushed with scarlet which do not open until July; the enlarged bractlets of this Colorado plant are spreading, not reflexed.

The tree with the showiest fruits in the Arboretum in July is the Tartarian Maple (*Acer tataricum*) which is an early-flowering, very hardy small tree from southeastern Europe and western Asia. The wings of the fruit, which is now fully grown, are bright red and their beauty is heightened by the contrast of the dark green leaves. The female plants of the so-called Mountain Holly (*Nemopanthus mucronata*) are handsome in July when their rose-red berrylike fruits are ripe. *Nemopanthus*, which belongs to the Holly Family, consists of a single species which is common in cool moist woods in the northeastern United States and eastern Canada, and is a wide round-topped shrub with erect stems covered with gray bark, thin pale green leaves and inconspicuous flowers. It has taken kindly to cultivation in the Arboretum where there are a number of plants in the Holly Collection in the rear of the Horsechestnut Collection. The snow-white fruits of the red and yellow-flowered forms of the North American *Cornus stolonifera* are now ripe. Very beautiful in winter from the bright coloring of its stems and branches, this Cornel is equally beautiful in July and August when it is covered with its large and abundant clusters of fruit. A garden form of the Old World *Cornus alba* (var. *Rosenthalii*) is fruiting abundantly this year and promises to be a valuable addition to July and August fruiting shrubs.

Some July Flowering Trees and Shrubs. Among the Lindens the last to flower are the small-leaved European *Tilia cordata* and its varieties. The handsomest of these is the var. *cordifolia* which differs from the type in its larger leaves and rather larger flowers. The Arboretum specimen is a shapely tree which this year when in flower has been more conspicuous than any Linden-tree in the Collection. The Japanese Clethra (*C. barbinervis*) is in flower about two weeks earlier than the native *C. alnifolia*. The Japanese species is a larger plant than *C. alnifolia* and in Massachusetts has grown ten or fifteen feet high and nearly as much through. The foliage is of a lighter green than that of the American plant; the flowers are less crowded in the racemes and lack the odor which makes *C. alnifolia* one of the most delightful of summer-flowering shrubs. In the Arboretum plants of the Japanese Clethra have so far escaped the attacks of red spiders which often disfigure here those of *C. alnifolia*.

Indigofera. Five species of this genus of the Pea Family are now blooming in the Arboretum. They are small plants with handsome flowers in terminal racemes, well suited to decorate a garden border. The three species with pink flowers, *I. Kirilowii*, a native of northern China, Manchuria and Korea, *I. Potaninii* and *I. amblyantha* are perfectly hardy and the last will continue to open its small flowers on the

lengthening racemes until October. The other species, *I. Gerardiana* and *I. decora*, are killed to the ground every winter, but like herbaceous plants produce new stems in the spring which never fail to flower during the summer. *I. decora* is a native of southern China, and in the Arboretum the flowers are pure white. *I. Gerardiana*, which is a native of the northwestern Himalayas, has gray-green foliage and rose-purple flowers. This is the least beautiful of the five species now growing in the Arboretum. The collection still needs *I. hebeptala*, another Himalayan plant which is rarely seen in English gardens. It has red flowers, in elongated racemes, and, judging by the picture of it which has been published is a handsome plant. This and another red-flowered Himalayan species, *I. atropurpurea*, are desired by the Arboretum.

Rubus lacinatus. This European plant, which produces long red stems and deeply divided leaflets, is one of the handsomest of the Brambles and is well suited to cover banks or to train over fences and arbors. It is now in flower in the Shrub Collection. In England it is valued for its fruit which is described as "one of the finest blackberries in size and flavor." In competition with some of the American blackberries it will not probably find much favor in this country. There are two double-flowered Brambles in the collection which are also in bloom and which are also important ornamental plants, also well suited to cover arbors and fences. They produce in a season stems from ten to twenty feet long and their white or pink flowers in long, many-flowered crowded clusters resemble miniature Roses. These plants are called *Rufus ulmifolius* var. *bellidiflorus* and *R. thyrsoides flore pleno*, and seem to be little known in the United States.

Schizophragma hydrangeoides must be included among the shrubs which flower in July. This beautiful climbing plant has not had a successful career in the Arboretum. Seeds were first sent here in December, 1876, from Sapporo in northern Japan with those of *Hydrangea petiolaris*, *Syringa japonica*, *Phellodendron sachalinense* and other interesting plants. A large number of *Schizophragma* plants were raised and sent to other American and European gardens. Those planted in the Arboretum never flourished, and soon disappeared, probably because the right place was not found for them. Plants raised later also disappeared; and it is a matter of some satisfaction at the Arboretum that this beautiful plant, after forty-three years of failure, is at last established on the Administration Building where it has flowered this year for the first time. It clings as firmly to the brick wall as *Hydrangea petiolaris*; the leaves are smaller, more circular in shape, more coarsely toothed and of a darker color. When in flower *Schizophragma* is more interesting, although not as showy as the *Hydrangea*, for instead of the surrounding ring of neutral flowers there are only two neutral flowers to each of the divisions of the large compound inflorescence; these neutral flowers are white, ovate, often an inch or more long, and hang on long slender stems an inch in length. *Schizophragma* appears to be an exceedingly rare plant in American gardens in which *Hydrangea petiolaris* often passes for it.

These Bulletins will now be discontinued until the autumn.

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BULLETIN

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JAMAICA PLAIN, MASS.

OCTOBER 17, 1919

This is a good time to visit the Arboretum. The unusually mild winter and the abundant summer and autumn rains have been favorable to most plants, and probably the Arboretum has never looked better at this season of the year than it does this week. Conifers, particularly Junipers, have not before been in better condition, and the fresh green of the leaves on many trees and shrubs is unusual here the middle of October and heightens the beauty of the autumn colors of the leaves of those plants which change color early under all conditions.

Autumn Colors. There can be few places in the world where colors of ripening leaves are so varied or are continued through so many weeks. For the leaves of the plants of eastern Asia, which are well represented in the Arboretum, usually are beautifully colored after those of our eastern American trees, with the exception of the Oaks, have fallen. A few conspicuous exceptions to this general rule are worth noting:— Nearly three weeks ago and before the leaves of the Red Maple (*Acer rubrum*) had begun to change color, those of the Cork-barked tree of eastern Siberia (*Phellodendron amurense*) were bright gold color, making the two trees on the right-hand side of the Meadow Road the most brilliant objects in the Arboretum. These trees have now been bare of leaves for several days. They are still interesting objects, however, for now that the leaves have gone it is possible to see clearly the pale, deeply furrowed soft corky bark of the trunk and large branches to which this tree owes its name. The genus *Phellodendron* is confined to eastern Asia, and the five species now known are well established in the Arboretum. On account of this

bark *Phellodendron amurense*, the type of the genus, is perhaps the most interesting species. The others, however, are larger and more shapely trees, and the species of northern Japan and Saghalien (*P. sachalinense*) is well suited for street planting. The pungent oil which abounds in the leaves of these trees protects them from the attacks of leaf-eating insects. Another conspicuous exception to the rule that the leaves of Asiatic plants change color later in the autumn than those of eastern American plants is found in the Burning Bush with winged branches, *Evonymus alatus*, a native of Japan and Korea. The flowers and fruits of this plant are small and inconspicuous, but few plants surpass it in the beauty of its rose-colored autumn foliage which is unlike that of any other plant in the Arboretum. This plant, if it gets the opportunity, will spread into a shrub from ten to fifteen feet across with lower branches laying close to the ground, and will form a compact round-topped head. It is a plant, however, which unless it can have plenty of room in which to grow is not worth a place in the garden. *Acer ginnala* is another Asiatic plant which takes on its autumn colors early. This small Maple, which is a native of eastern Siberia, Manchuria, and Korea, is not surpassed in autumn brilliancy by any American Scarlet Maple. One of the early introductions of the Arboretum it has been taken up by some American nurserymen and is now sometimes found in northern gardens. A blue and a brown dye are obtained from the leaves, which are shipped in quantity from Korea into China. As this little Maple is very hardy, and grows rapidly and produces large crops of seeds it might have been advantageously planted commercially in the northern states had not vegetable dyes been so generally superseded by synthetic dyes, a product of coal tar; and it is probable that these Maple leaves may not be much longer used in China, which is already receiving considerable quantities of blue dye manufactured in the United States. Another Korean and Manchurian Maple, *Acer mandshuricum*, also illustrates the fact that the leaves of some Asiatic trees turn color and fall early in the season. This is one of the group of Maples with leaves composed of three leaflets and one of the largest and handsomest trees of Manchuria and northern Korea. Like those of a few other plants, notably the Japanese *Acer nikoense*, the leaflets of this Maple retain in autumn the pale color of their lower surface which increases the beauty of the bright red upper surface. Seedlings of this Maple have grown rapidly in the Arboretum and have flowered and produced infertile seeds for the last two or three years. The plants are hardy; some of them, however, have died, and the fact that small individuals only a few years old have flowered indicates that there is something in the climate or soil of Massachusetts which does not suit them. This is unfortunate for *Acer mandshuricum*, from which much has been expected here, is a tree of great beauty and interest. Little attention has been given by park- and garden-makers to the selection and arrangement of plants to produce brilliant and harmonious autumn effects of autumn colors, with the result that there is less beauty at this season of the year in planted grounds than it is possible to obtain. Trees and shrubs grouped to produce the best autumn color effect would compose well at other seasons of the year. The success of such an arrangement of plants

depends on knowledge which can only be obtained by the constant study at all seasons of the year of living plants. Opportunity for such study is found in the Arboretum, in which nearly every tree and shrub which can grow in the northern United States is established. The leaves on some individuals of a species turn more brilliantly than on other individuals of the same species and this individual character is constant from year to year. It is therefore possible to increase the number of trees with exceptionally handsome autumn foliage by grafting or budding, grafts or buds being taken from selected trees worked on stock of the same species, as trees with pyramidal or pendulous branches are propagated. The value of propagating trees for the autumn color of their leaves is shown by the Red Maple-tree which stands on the left-hand side of the Meadow Road directly opposite the entrance to the Administration Building. This tree was obtained by grafting a Red Maple seedling with a branch of a tree growing in Brookline with crimson autumn foliage. The leaves of the grafted tree have the same color as those of the Brookline tree, and for more than two weeks this tree has been the brilliant object of the Arboretum. Near it are standing two seedling Red Maples. The leaves of one of these trees turned pale yellow and are fast falling; from the other the nearly green leaves have already fallen.

Plants for the Edge of Beds of Large Shrubs. A correspondent of the Arboretum writes: "Can you recommend several shrubs suitable for edging planting before taller shrubs? I have used *Xanthorrhiza* considerably, but it is almost the only shrub that I find low enough for that purpose. I want to bring some Cornels down to the edge of a drive and I also want to plant in front of Privets and Thorns." There are not many shrubs with deciduous leaves which can be successfully used for this purpose. The best which has been tried in the Arboretum is the Fragrant Sumach (*Rhus canadensis*, or as it was formerly called *Rhus aromatica*). This widely distributed North American shrub rarely grows more than five feet tall, and when planted in good soil is often broader than tall with lower branches spreading flat on the ground, and upper branches erect spreading or drooping. In early spring before the leaves appear the branches are covered with clusters of small bright yellow flowers which in June are followed by dull red fruits which are pretty much hidden by the small compound leaves. Among the small shrubs in the Arboretum few are more brilliant at this season of the year for the leaves turn gradually to bright scarlet and orange. This *Rhus* has been largely planted along some of the drives and this week it is a conspicuous feature of the Arboretum. The *Xanthorrhiza* has also been largely and successfully used here. It makes a neat border plant, and it is also well suited to grow under tall shrubs or trees. The *Xanthorrhiza* spreads rapidly by underground stems which do not grow more than from twelve to eighteen inches high; the small purple flowers which are arranged in drooping clusters, appear as the leaves unfold; these are pinnate, of a cheerful green color and in the autumn turn pale yellow. Some of the North American Roses might be used to edge beds of larger shrubs although most of them are too upright in habit to be really useful for this purpose. There is a dwarf form of the Choke-berry (*Aronia nigra*) in the Arboretum collection which might be used to advantage for this

purpose. Unfortunately, however, it probably cannot be found in commercial nurseries. This is true, too, of the dwarf Quince of Japan (*Chaenomeles japonica*, sometimes called *Pyrus* or *Cydonis Maulei* in European nurseries). This is a shrub with spreading branches which do not rise more than two feet above the ground. The flowers vary on different plants from crimson to pink and to white, and are followed by small yellow, fragrant quince-like fruit. These handsome little shrubs, like the larger Quinces and many related plants, attract the San José scale, which needs careful watching and frequent spraying. All the Snowberries (*Symphoricarpus*) including the red-fruited *S. vulgaris* can be used in front of larger growing shrubs; and the trailing stems of one of the American Burning Bushes (*Evonymus obovatus*) make a good border when taller plants protect them from the direct rays of the sun. Some of the low-growing Chinese Cotoneasters, like *C. horizontalis* with its varieties *Wilsonii* and *perpusilla*, and *C. apiculata* are well suited in habit to plant before larger shrubs. If used, however, with Cornels or Privets they might appear too exotic, and their proper place is in front of beds of the large-growing Chinese Cotoneasters. Their value for this purpose can be seen on the southern slope of Bussey Hill where dwarf Cotoneasters have been planted before the large growing species. There are a few broad-leaved Evergreens which can be successfully used here to form an edging to beds of larger Evergreens. The best of them is probably *Andromeda floribunda* from the southern Appalachian Mountains, one of the hardiest and handsomest of the broad-leaved Evergreen plants which can be grown in this climate. It makes a good edging, and with abundant space a wide, symmetrical specimen. Two low hybrid Rhododendrons, *R. myrtifolium* and *R. arbutifolium* (*R. Wilsonii* of many gardens) are useful to plant on the margins of groups of taller growing kinds; and *R. carolinianum*, although it blooms earlier than most Rhododendrons which are hardy in this climate, might be used for the same purpose.

Crataegus in Autumn. A pretty good idea of the value of American Hawthorns as ornamental plants at this season of the year can be had by following the path which leads to the right just inside the gate at the Forest Hills entrance to the Arboretum. On the bank between this path and the boundary wall are a few Hawthorns which are now forty years old, and have grown to a good size in spite of the poor soil in which they were planted. Among them are *C. nitida*, *C. Dawsoniana*, *C. arkansana*, *C. Douglasii*, *C. aprica*, *C. pruinosa*, *C. succulenta*, *C. coccinioides*, *C. prunifolia* and *C. fecunda*. These trees are covered with ripe or ripening fruit; on some of them the leaves are still as green as they were in summer, on others they have assumed brilliant shades of scarlet and orange. American Hawthorns thrive in soil impregnated with lime; they can therefore be successfully grown over a large part of the United States where Rhododendrons, Azaleas, and related plants to which lime is fatal cannot be used. Little is known yet of the beauties of American Hawthorns as cultivated plants but enough has been seen of them at the Arboretum to show that among them are some of the most beautiful trees and shrubs which can be grown in this country especially in the middle western states where lime abounds and there are great extremes of temperature.

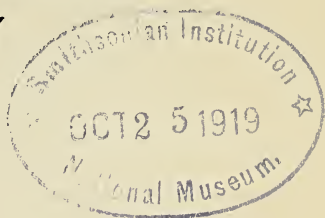
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***Pseudolarix amabilis*.** It is an interesting fact that the monotypic genera of conifers, that is, the genera of a single species, of the northern hemisphere, are confined to eastern Asia. There are seven of these genera: *Glyptostrobus*, *Taiwania*, *Fokienia*, *Cryptomeria*, *Thujopsis*, *Sciadopitys*, and *Pseudolarix*. Unfortunately several of these trees are not hardy in the northern United States. *Glyptostrobus*, *Taiwania* and *Fokienia* grow in warm regions; they might succeed in some parts of Florida and Louisiana, but California will probably prove our best region for them. *Cryptomeria* can just be kept alive in the Arboretum, but fairly healthy specimens can occasionally be seen in gardens on Long Island and southward in the eastern states. An abnormal form of this tree (var. *elegans*) appears to be rather hardier than the type and to be more often cultivated in the eastern states. There is a small tree of *Thujopsis* in Wareham, on Cape Cod, but this beautiful Japanese tree has not proved to be hardy in the Arboretum. A variety (var. *Hondai*) from the extreme northern part of Hono may prove harder than the type. Seedlings of this northern variety have been growing in the Arboretum since 1915. *Sciadopitys*, the Japanese "Umbrella Pine," although the leaves are sometimes badly burned in severe winters, is hardy in Massachusetts. It is an interesting and handsome tree, forming while young a dense pyramid. It grows so slowly, however, that it will not be popular with those planters with whom rapidity of growth is the chief merit in a tree. For the northern states and for general cultivation the most valuable of the monotypic Asiatic conifers certainly is the Chinese Golden Larch *Pseudo-*

larix amabilis, a tree with the deciduous leaves of the Larch and large cones erect on the branches with scales which fall when mature from the axis of the cone like those of Fir-trees and the Cedar of Lebanon. As a wild tree not much is yet known of the distribution, size and economic value of *Pseudolarix*. Robert Fortune, who was sent to China by the London Horticultural Society in 1843 as a botanical collector, first made known this tree to Europeans. He found it first in temple gardens growing in pots and much stunted; and it was not until 1854 in a journey in the province of Chekiang that Fortune found *Pseudolarix* growing in the open ground at the monastery of Tsan-tsin. "They were growing," he writes, "in the vicinity of a Buddhist monastery in the western part of the Province of Chekiang at an elevation of 1000 or 1500 feet above the level of the sea. Their stems which measured fully five feet in circumference two feet from the ground, carried this size, with a slight diminution, to a height of fifty feet, this being the height of the lower branches. The total height I estimated about 120 or 130 feet. The stems were perfectly straight throughout, the branches symmetrical, slightly inclined to a horizontal form, and having the appearance of something between the Cedar and the Larch." Fortune found these trees, which had probably been planted, covered with cones and sent seeds home to England. Unfortunately only a small percentage of them germinated. The following autumn, in the hope of securing another supply of seeds, Fortune explored a higher range in the western part of Chekiang on which he had heard that the *Pseudolarix* was more abundant. Here he found at altitudes just below 4000 feet a larger number of both large and small trees which he thought had also been planted. The largest tree which Fortune saw at this high altitude he estimated to be one hundred and thirty feet high; the trunk was eight feet in circumference, and the lower branches nearly touched the ground. There were no cones on these trees and Fortune was told by the monks that cones were only produced on alternate years. He dug up a few plants which finally reached England, and it is probable that the largest trees now growing in Europe and the United States were of this sending. After Fortune's visit to the Chekiang Mountains in 1855, *Pseudolarix* was not seen again in China until 1878 when Charles Maries, a botanical traveller for the Veitch's of London, found it at the Temple of Teen Cha on the Lushan Range in Kiangsi and sent seeds to England. The last botanist to see the *Pseudolarix* in China, E. H. Wilson, met with it in August, 1907, at an altitude of about 4000 feet on the Lushan Range near Kuling which is the most western station where this tree has been seen in China by foreigners. The larger trees near Kuling had been planted but Wilson saw small trees on the mountain side which were evidently wild, and it is probable, therefore, that these small trees are the only self-sown trees of *Pseudolarix* seen by European botanical travellers unless the "forests of the Larch-fir" on the mountains south of Poyang Lake in Kiangsi which were mentioned by Barrow in his "Travels in China," published in 1804, and which as Wilson has pointed out must have been *Pseudolarix*, were wild trees. In spite of all of Fortune's efforts to introduce this tree into Europe it has not become common. The largest specimen in Europe is in the Rovelli nursery at Pallanza on Lake Maggiore in Italy. In 1907 this tree was sixty-four feet

high with a trunk six feet ten inches in girth. It has produced seeds at different times for several years, and these germinate freely where they fall under the tree. There are a few of the original trees in France, Germany and Belgium, the largest probably being the tree which is in the nursery of the Horticultural Society at Calmpthout near Antwerp, which in 1910 was said to be forty-six feet tall with a trunk three feet in girth. There are several of these original trees growing in Great Britain, but they are smaller than the large specimen on the continent, for apparently *Pseudolarix* needs a hot summer and autumn sun for its rapid growth. There are two and perhaps three of the plants sent by Fortune to England in 1854 growing in the United States. The largest of these was imported by S. B. Parsons in 1859, and planted in his nursery at Flushing, Long Island. In 1895 this tree was fifty-five feet high with a trunk two feet in diameter. This tree is still in perfect health, and is now fully eighty feet high (estimated) with a tall straight trunk two feet ten inches in diameter, free of branches for from twenty to twenty-five feet and carrying a broad, symmetrical, pyramidal head. The bark, unlike that of the Larches, is thick, divided into broad rounded ridges and is dark brown. For many years this tree has produced large crops of seeds, usually only in alternate seasons. It is certainly one of the most interesting exotic trees in eastern North America and well worth a visit. Another of Fortune's original trees is growing in Mr. Hunnewell's Pinetum at Wellesley, Massachusetts. The date of the importation of this plant is not known but it was probably before 1865. This is rather a flat-topped tree and has retained its wide spreading lower branches. In 1905 this tree was thirty-five feet high with a trunk four feet in circumference and a spread of branches of twenty-seven feet. This tree produced fertile seeds previous to 1896. In that year the late Mr. Probasco stated that the *Pseudolarix* which he had planted in the neighborhood of Cincinnati was rather larger than the Wellesley tree. It is fair to assume, therefore, that this was also one of the original Fortune plants. The two fine specimens planted by Mr. C. A. Dana at Dosoris, Long Island, were probably raised from the seeds sent to England by Maries in 1878. *Pseudolarix* is planted in the Arboretum on the left-hand side of the Bussey Hill Road close to the Walter Street entrance. The two larger trees were imported from England in 1871; the smaller trees were raised here from seed produced by the Wellesley tree and sown in January, 1906. *Pseudolarix* is a tree of extraordinary botanical interest; as a timber tree it may prove valuable; for the decoration of lawns and parks it deserves the attention of all lovers of handsome trees. It is perfectly hardy at least as far north as Massachusetts; the leaves, which are longer and broader than those of the Larches, are light green when they first appear in early spring, dark green during the summer and until they begin to change color early in October when they generally become the color of old gold, some of the leaves remaining green after others have assumed their deepest autumn tints. The leaves of the *Pseudolarix* have not been attacked yet by the insects which too often destroy in early summer the beauty of Larch trees. Planted as a specimen on a lawn as the Wellesley tree was planted *Pseudolarix* may be expected to retain its lower branches for many years; planted close together in groves

it will grow taller and form a tall Larch-like trunk. As *Pseudolarix* seeds are produced in quantity by at least two trees in the United States, and probably by several trees in Europe, there is no reason why this tree should not be taken up by American nurserymen and brought within reach of the lovers of handsome and interesting trees. The trees at Flushing and at Wellesley are not producing seeds this year.

Zelkova serrata, the Keaki of the Japanese, is another Asiatic tree which is still too little known in the United States. The oldest tree in this country is growing on the estate of Mr. Henry Everett in Barnstable, Massachusetts. The seeds which produced this tree were brought from Japan in 1862 by John Wilson, who gave them to Captain Frank Hinckley. Only one plant was raised from these seeds. It is now a broad-headed tree with a short, stout trunk divided into several large ascending stems. A little later seeds of the Keaki were sent from Japan to the Parsons nursery at Flushing, either by Dr. Hall or by Mr. Thomas Hogg, and the best of the trees, the result of this introduction, known to the Arboretum are in Dr. Hall's plantation in Bristol, Rhode Island. The largest of these trees are now fully seventy feet high with tall stems from two to two and a half feet in diameter. These trees have for years been producing large crops of seeds and quantities of seedlings spring up under the trees, and at long distances from them, the seeds being widely scattered by the wind. A specimen with a tall clean stem and shapely head which has been planted by the roadside in Warren, the next town to Bristol, indicates that the Japanese *Zelkova* might be successfully used as a street or roadside tree. It is as a timber tree, however, that this *Zelkova* deserves the attention of Americans. It is the most important hardwood tree of Japan and Korea. The wood is tough, elastic and durable in the ground and when exposed to the air. It is considered the best wood for building in the Empire, and furnishes the great round columns which support the roofs of Japanese temples. It is universally used in Japan in making jinrikishas, and quantities of the wood are sent from Korea into China for this purpose. The Keaki alone has made the jinrikisha possible just as the Hickory-tree has made possible in this country the light wagon and the trotting horse. The demand for the wood has made the Keaki comparatively rare. That it was once a noble tree, however, is shown by the great specimens which have been preserved in temple gardens and by village roadsides. Such trees are often at best one hundred feet high with the trunks eight or ten feet in diameter.

Viburnums. The handsomest *Viburnums* this week in the Arboretum are *V. prunifolium*, a tree species of the Middle States, with dark purple leaves and fruit which is still pale pink but later will be dark blue, and the Japanese *V. dilatatum*, a broad round-headed shrub with wide flat clusters of small bright red fruit, and dark red almost purple leaves.

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The Flowering Dogwood (*Cornus florida*). It is perhaps not necessary to call attention again to this tree which in recent years has been planted in considerable numbers in those parts of the northeastern states where it is hardy, but the Flowering Dogwood has been exceptionally beautiful this year, and its value for the decoration of the parks and gardens of eastern North America cannot be too often insisted on. *Cornus florida* "composes well," as landscape gardeners would say, with the vegetation of eastern America, that is, where it is planted under our native trees or along the borders of natural woods it never looks out of place. In spring it enlivens the forest with sheets of the snow white floral bracts which surround the heads of small yellow flowers. In October the leaves of not one of our smaller native trees assumes more beautiful shades of crimson, scarlet, orange or yellow, and as the leaves change color gradually leaves which are still green are often mixed with those which have become brightly colored. The autumn beauty of the leaves is increased, too, by the contrast in the colors of their upper and lower surfaces, for only the upper surface changes color, the lower retaining until the leaves fall the pale or nearly white color of summer. In the autumn, too, the clusters of bright scarlet fruits add another charm to this tree which is often short-lived for birds devour the fruit almost as fast as it ripens. The conspicuous gray flower-buds which open the following spring are formed in the late summer and add to the beauty and interest of the tree during the autumn and winter. A variety of *Cornus florida* with red floral bracts was found in Virginia several years ago and has been

propagated and sold by American nurserymen. When in flower it is a showy tree but lacks the charm of the normal species. A variety of the normal form with pendulous branches is in the Arboretum collection but has no particular interest or beauty, and a form with flower-heads surrounded by a double row of bracts, which was a good deal advertised a few years ago, has little to recommend it. Beautiful as it is the eastern Flowering Dogwood is surpassed by the species of the northwest coast region, *Cornus Nuttallii*, which is a tree sometimes seventy or eighty feet high with heads of bracts five or six inches across. *Cornus Nuttallii* grows in damp woods in the shade of large coniferous trees, and it is difficult to keep it alive beyond the limits of its native forests. It has never succeeded in the Arboretum and has flowered in Europe in only a few gardens. The Japanese Flowering Dogwood, *Cornus kousa*, and its Chinese variety are hardy and handsome little trees which flower later in the season than our native species, with which they do not compare in beauty of flowers, foliage or fruit.

The Sassafras in Autumn. In good years and bad years the Sassafras never fails to become a conspicuous object of beauty in October when its dark green leaves turn yellow and orange color more or less tinged with red. This statement gives little idea of the warmth of color which the Sassafras produces when it grows, as it often does, on the border of a forest of Oak-trees on which the leaves are still green. The Sassafras is a handsome tree at other seasons of the year. In winter it is conspicuous by its deeply furrowed dark cinnamon-gray bark and bright green branchlets which in early spring are covered before the leaves appear with innumerable clusters of small bright yellow flowers. The leaves, which are sometimes deeply three-lobed and sometimes entire on the same branch, are not attacked by insects. The fruit is a bright blue berry surrounded at the base by the much enlarged and thickened calyx of the flower raised on a long bright red stalk. Among northern trees only Magnolias produce such bright-colored fruits. There is little time, however, to enjoy the fruit of the Sassafras for birds eagerly seek it as it ripens.

Crataegus. A few of the Old World Hawthorns produce fruit as large and handsome as any of the American species. The largest and handsomest is that of the Manchurian and Chinese *Crataegus pinnatifida* which is cultivated in orchards by the Chinese for its dark red fruits. Very beautiful this year is a variety of the European *C. oxyacantha* (var. *Gireoudii*) with thick, slightly lobed, dark green leaves and bright red, lustrous, short-oblong fruits half an inch in length. The branches of the small tree in the new collection of exotic Thorns on Peter's Hill are covered from end to end with fruit clusters which make it one of the most brilliant plants in the Arboretum this week. *Crataegus hiemalis*, a European tree of doubtful origin and by some authors considered a hybrid, is covered this year with its lustrous, dark wine-colored, ellipsoidal fruit half an inch long, drooping on long slender stems. More beautiful is a tree growing near *C. hiemalis* in the old Crataegus Collection near the Shrub Collection with small deeply divided leaves and depressed-globose, shining, dark red-brown fruit three-

quarters of an inch in diameter. It is probably a form of *C. orientalis* with fruit of an unusual color.

Late flowers. *Chrysanthemum sibiricum*, which has been flowering for several weeks on Azalea Path, will continue to open its white flowers until the buds are killed by a hard frost. This attractive plant is still rare in gardens, although it was introduced into this country fourteen years ago by Professor Jack who found it on Poukan-shan, the mountain close to the city of Seoul. This late-flowering Chrysanthemum is perfectly hardy; it produces seeds freely, and spreads also by underground shoots, so that once established it is likely to be a permanent feature in the garden. It is a shrub eighteen or twenty inches tall, with slender stems, woody at base, deeply divided, pale green, pungently aromatic leaves and white daisy-like flowers an inch and a half in diameter. A form with pale rose-colored flowers has been raised in this country. A handsomer plant now in bloom is *Chrysanthemum nipponicum* which is commonly cultivated in Japanese gardens and which is believed to grow naturally on the shores of some of the smaller islands of northern Japan. It is a stout-stemmed, compact-round-topped shrub which under conditions favorable to it grows from two to three feet tall and three or four feet through. The leaves are narrowly oblong-obovate, sessile, slightly toothed toward the apex, light green and lustrous above, pale below, and thick and leathery; they stand erect, and pressed close against the stem display only their lower surface. The flowers are produced on long stout stalks, each from the axil of one of the upper leaves; and as the flower-stalks increase in length from the lowest to the one in the axil of the topmost leaf the flowers are arranged in a broad flat cluster in which buds continue to open during many weeks or until they are destroyed by cold. The flowers are daisy-like with broad, pure white ray-flowers, and are from two to two and a half inches across. The flowers of this Japanese Chrysanthemum are sometimes injured in Massachusetts by October frosts. It is better suited, like the Japanese Anemone, to regions which enjoy a longer autumn than that of Massachusetts. It grows well in the neighborhood of Philadelphia and there are good plants on Long Island. With the protection of a pit or a cool greenhouse it would probably continue to open its flower-buds until Christmas.

The Mountain Halesia or Silver Bell Tree. Until the beginning of the present century the botanists who visited the high Appalachian Mountains appear to have taken it for granted that the Halesia which grows at altitudes above 2500 feet was the same as the bushy tree of the foothills and upland valleys of the Piedmont region and southward. This idea having been generally accepted and as the lowland plant had for more than a century been common in gardens no attempt was made to cultivate the mountain tree, and the gardens of the United States and Europe have been deprived of one of the handsomest trees of the North American forests. The lowland plant, *Halesia carolina*, is usually shrubby in habit with numerous stout stems wide-spreading from a short stem, and covered with nearly smooth or slightly scaly bark. The tree of the high mountains is not rarely eighty or ninety feet high with a straight trunk sometimes three feet or three feet and

a half in diameter, often free of branches for fifty or sixty feet from the ground and covered with bark separating into great platelike scales like those of a scaly-barked Hickory or a Swamp Cottonwood. The flowers are about one-third larger and the fruit is twice as large as the flowers and fruits of the lowland tree. The habit of the plant and the large flowers and fruits are reproduced in the seedlings, which when the seeds germinate begin to grow as trees with a single stem. The seedlings show no variation in habit, and the young trees grow with a single straight stem with short branches which form a narrow symmetrical, pyramidal head. The trees often begin to flower and to produce fertile seeds before they are ten feet tall. The mountain *Halesia* has been described as a variety (var. *monticola*) of *H. carolina* but it will probably be, when better known, considered a species. This tree was introduced into cultivation by Mr. Harlan P. Kelsey who for many years has maintained in western North Carolina a nursery of Appalachian plants. By him it was sent to the Park Department of Rochester about twenty-five years ago, and in 1907 it came from Rochester to the Arboretum. This mountain tree has proved to be perfectly hardy in the Arboretum where it is growing rapidly and where it has now flowered and produced fruit since 1913. It is a tree which seems destined to play an important part in the decoration of American parks and which may prove useful for street and roadside planting.

***Photinia villosa*.** This small tree or arborescent shrub which has been covered with bright red autumn leaves was last week the most conspicuous object in the Shrub Collection. It is a native of Japan and China, and although it was introduced from Japan, probably in 1864, by the Parsons Nursery at Flushing, Long Island, it does not appear to be well known in this country. *Photinia* is related to *Crataegus*; it has small white flowers in clusters, and small, shining, scarlet fruits which remain on the branches until after the leaves fall.

***Cotinus americanus*.** The so-called Smoke-tree (*Cotinus coggryia*) of eastern Europe is found in many old-fashioned gardens in which it is conspicuous in summer by the great clusters of the much-lengthened, hairy, colored stems of the small flowers. Much less well known is the American species of this genus. The American Smoke-tree grows naturally only in the neighborhood of Huntsville in northern Alabama, in southern Missouri, and in eastern Oklahoma and Texas. First raised in the Arboretum in 1882 from seeds collected on the high limestone ridge a few miles south of Huntsville, Alabama, the American *Cotinus* has proved perfectly hardy here. It has grown, however, into a broad tall shrub and not as a tree, although on the Huntsville ridge trees thirty feet tall were once abundant. The "smoke" of the American species as compared with that of the Old World plant is inconspicuous, and its value is found in the splendid orange and scarlet coloring of the leaves at the end of October when it is one of the conspicuous plants of the Arboretum. A large specimen can be seen on the left hand side of the Meadow Road next to the Sumachs, and there is another by the road near the top of Peter's Hill.

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Conifers. Representatives of only fourteen genera of the twenty-nine genera into which conifers are now usually divided can be grown in the northeastern states. None of the five genera which are confined to the Southern Hemisphere can be grown here, and of the two genera *Callitris* and *Libocedrus* which have representatives north and south of the equator only the North American *Libocedrus* is growing in the Arboretum. Seven of the genera of eastern Asia consist of a single species, but unfortunately only three of these interesting trees, *Pseudolarix*, *Sciadopitys* and *Cryptomeria*, find places in northern collections. Of the other genera with hardy representatives only *Taxodium* is confined to North America, the others being widely distributed through the Northern Hemisphere. Important genera of the Northern Hemisphere with more than one species which cannot be grown in the Arboretum are the Chinese *Keteleeria* and *Cunninghamia*, *Sequoia* and *Cupressus*.

Pinus among the conifers contains the largest number of species and, with the exception of *Juniperus*, is the only northern genus which extends into the tropics. It is not surprising, therefore, that of the some seventy species of *Pinus* which botanists now generally recognize less than half are in the Arboretum collection where there are now growing twenty-seven species with numerous distinct geographical varieties. The collection contains all the species of the northeastern and middle United States, eastern Canada and the Rocky Mountains, but only four or five of the Pacific Coast species. The Pines of Mexico, which is one of the headquarters of the genus, are represented only by *Pinus ayacahuite*. Europe has contributed to the col-

lection only the species of the northern, central and eastern parts of the continent, for the interesting species of the south and southeast are not hardy in the Eastern States, although they flourish on the Pacific Coast. Of the species of the Himalayas only a White Pine, *Pinus excelsa*, can be induced to grow here. The Pines of the Chinese Empire, with the exception of the tropical or semitropical *Pinus Massoniana*, are established in the Arboretum. They are *Pinus sinensis*, with three distinct geographical varieties, which when better known may prove distinct species, *P. Armandi* and *P. Bungeana*. All the Pines of Siberia, Manchuria, Korea, and of Japan proper, can be seen growing and in fairly good condition in the Arboretum.

Larix, although widely distributed through the northern and elevated parts of the Northern Hemisphere, contains only a few species. They are all growing in the Arboretum with the exception of the Himalayan *Larix Griffithii* which is not hardy, and the alpine species of western North America and western China, *Larix Lyallii* and *L. Potaninii*, which although hardy have not been able to adapt themselves to sea-level conditions. Hybrid Larches are known and are growing in the Arboretum.

Picea, which grows in most northern regions, does not range southward, although it occurs on the southern slopes of the Himalayas and on the high mountains which form the border between western China and Thibet. Although many of the Spruces lose their beauty early in this climate they can all be grown in eastern Massachusetts with the exception of the two Himalayan species, the Formosa *Picea morrisonicola* and the two species of Pacific North America, *Picea sitchensis* and *P. Breweriana*. The three European Spruces are in the collection one of these the so-called Norway Spruce (*Picea Abies*) has been more generally planted in the northeastern states than any other Spruce. It is hardy and grows rapidly for forty or fifty years, and then usually begins to fail in the top and soon becomes unsightly. The general planting of this tree in New England during the last sixty or seventy years must be considered a misfortune. The handsome Balkan Spruce (*Picea omorika*) which has now been growing in the Arboretum for thirty-eight years, is still in good condition and gives every promise of being a valuable tree in this climate. Unfortunately, however, it is attacked by the borer which does so much injury to the native White Pine. The Spruce of the Caucasus (*Picea orientalis*), which resembles in general appearance the native Red Spruce, has been growing in Massachusetts for more than fifty years; like the Balkan Spruce it too often loses its leader by the attacks of borers. The oldest specimen of the Siberian Spruce (*Picea obovata*) in the Arboretum collection was raised here from seed forty-three years ago. It has grown slowly but is in good health and retains all its branches. No less than seventeen Spruces discovered in China and Manchuria during the last twenty years are established in the Arboretum, and among them only *Picea Sargentiana* has not proved to be perfectly hardy in this climate. Most of these Spruces are large, handsome and valuable trees in their native forests and there seems to be no reason why some of them at least should not succeed here permanently. At least fifty years more,

however, will be needed to settle this question. One of the Spruces of northern Japan, *Picea jezoensis*, and its southern form (var. *hondoensis*) have grown miserably in Massachusetts up to the present time and give little promise of ever being valuable in this climate. The rare Tiger-tail Spruce (*Picea polita*) grows rapidly and is a perfectly hardy tree, but often begins to lose its lower branches before it is thirty feet tall. The northern *Picea Glehnii*, introduced by the Arboretum from seeds obtained by Professor Sargent in Hokkaido in 1892, now promises to be a handsome tree in this climate. The handsomest of the Japanese Spruces, judged by the few trees cultivated in Massachusetts, is *Picea bicolor*, or as it is more commonly called, *P. Alcockiana*. This tree, which is rare in Japan, was discovered in 1862 during the first ascent of Fuji-san by Europeans. Seeds were collected at this time and sent to Europe and it is probable that the few large trees of this Spruce cultivated in the United States and Europe were raised from these seeds. The trees cultivated in Europe under this name are usually *Picea jezoensis* var. *hondoensis*, and the Arboretum knows only five of these trees in the United States, two in the Hunnewell Pinetum, one also planted by Mr. Hunnewell in the grounds of the Town Hall at Wellesley, and two on the Phillips Estate in North Beverly, Massachusetts. In the Arboretum there are only small unsatisfactory grafted plants, and for years the Arboretum has tried without success to obtain a supply of seeds from Japan, for, judging by our present knowledge of the behavior of Spruces in this climate, *Picea bicolor* promises to be the handsomest which can be grown in this part of the country.

Abies. Fir-trees, like the Spruces, are widely distributed with many species through northern and elevated regions of the Northern Hemisphere, growing rather further south than the Spruces, as one Fir-tree grows in Mexico, one in Spain, one in northern Africa and several in southeastern Europe and Asia Minor. Many of the Firs are large and handsome trees, but the genus has not contributed much to the beauty of our northern plantations. Many of the handsomest and most interesting species are not hardy here, and several of the others are not presentable for more than a few years. Judging from the results which have now been obtained with these trees there are only two Firs which can be depended on to retain their beauty here for more than fifty years. These are the western American White Fir (*Abies concolor*), especially the form which grows on the mountains of southern Colorado, and the Japanese *Abies homolepis* or *brachyphylla*, a splendid tree with dark green leaves white on one surface and large purple cones. The variety of this tree with green cones (var. *umbellata*) has grown more rapidly in the Arboretum than the purple-coned tree, but it is a tree of more open habit and with lighter green leaves, and is less valuable as an ornamental tree. *Abies cilicica* from Asia Minor and *A. cephalonica* from southeastern Europe have grown well in Massachusetts for many years; although they have now nearly recovered, these two trees suffered severely in the cold winter of 1917-18.

Thuja, the name of the Arbor Vitae, is a small genus confined to eastern and western North America, Japan, Korea and north China.

All the species with many varieties are in the Arboretum, and all do well here with the exception of the north China *T. orientalis* which probably needs a drier climate, for it is the only conifer which really grows well on the plains of western Kansas. The Red Cedar of the northwest coast (*Thuja plicata* or *gigantea*) is one of the great trees of the world, and in the Arboretum has grown to be one of the handsomest conifers in the collection.

Chamaecyparis, which differs from *Cupressus* chiefly in the fruit which matures at the end of the first season, is the name of the White Cedar. The genus is confined to the coast regions of eastern and western North America, to Japan and Formosa. The two Japanese species often called *Retinosporas*, with many abnormal forms, are common in gardens and old inhabitants of the Arboretum. The eastern American species, *Chamaecyparis thyoides*, although a common inhabitant of Massachusetts swamps, has grown slowly in the Arboretum and has occasionally been partly killed in severe winters. The handsomest and the largest of the genus, and one of the noblest of North American trees, *Chamaecyparis Lawsoniana*, the Lawson Cypress as it is often called, can only drag out a miserable existence here, and the beautiful Alaska Cedar, *Chamaecyparis nootkatensis*, is not hardy here.

Tsuga, the name of the Hemlock, is another small genus with species in eastern and western North America, Japan, western China and the Himalayas. The western American species exist here, but will probably never become large trees. The mountain Hemlock of Japan (*T. diversifolia*) is hardy and healthy, but it grows slowly and is not as handsome as our native species. The handsome but less hardy *T. Sieboldii*, a more southern tree, lives in sheltered positions but does not seem suited for general planting in Massachusetts. The Chinese species (*Tsuga chinensis*) has lived for several years in the Arboretum, although it was a good deal injured in the winter of 1917-18. The handsomest of the Hemlocks which can be grown in Massachusetts and now one of the most beautiful trees in the Arboretum is a native of the southern Appalachian Mountains, *Tsuga caroliniana*.

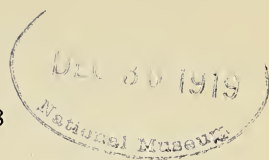
Pseudotsuga. Of the three species of this genus only the Rocky Mountain form of *Pseudotsuga taxifolia* is hardy here. It has been growing in Massachusetts since 1863, and up to this time has proved one of the hardiest, handsomest and most rapid growing conifers which has been brought into this part of the country.

Juniperus. This is one of the largest and most widely distributed genera of conifers, for Junipers are found in all temperate and elevated parts of the Northern Hemisphere; they flourish in arid semi-desert regions in the interior of continents, and extend into the tropics. Some species are large and valuable trees and others are prostrate shrubs, the same species being sometimes a tree and sometimes a shrub. Massachusetts is too cold and wet for most Junipers, and only a small number of species with a number of varieties have been successfully grown in the Arboretum. The mild winter and the wet summer and autumn have helped this collection and the Arboretum Junipers have not before been in as good condition as they are now.

These Bulletins will now be discontinued until the spring of next year.

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